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ABSTRACT

This report presents results of follow-up surveys of students and parents who had been part of a 1986/87 study of transition experiences of deaf high school students. The report examines post-high school transition experiences including postsecondary education or employment outcomes. Most of the analyses are based on responses of 592 deaf youth and 101 parents. An introduction by Arthur N. Schildroth describes the original study, the follow-up surveys, and limitations. The second chapter, "Non-College-Bound Deaf Youth" by Kay H. Lam, discusses the demographic characteristics, employment status and types of jobs held, wages, sources of job acquisition, and satisfaction with employment of respondents who did not receive any postsecondary education. The third chapter, "Postsecondary Education: Its Impact and Outcomes" (Brenda W. Rawlings), reports data for the group receiving postsecondary education, including demographic characteristics; types of programs entered; reasons reported for matriculating at a particular program; subject majors; and relationship of their postsecondary education to employment. Chapter 4, "Rehabilitation and the Transition of Young Deaf Adults" (Arthur N. Schildroth), concentrates on the involvement of state offices of vocational rehabilitation (VR) in terms of whether and how often VR services were provided, kinds of services provided, satisfaction of respondents with VR assistance, and relationship of parental transition concerns to the actual provision of VR services. Chapter 5, "Relationships between Academic Performance on an Achievement Test and Later Postsecondary Outcomes" (Debra E. Rose), studies correlations between high school achievement test scores and certain high school practices (e.g., tracking) and between test scores and later postsecondary outcomes (e.g., employment). It also relates test scores to the presence of additional disabilities. Chapter 6, "School and Demographic Predictors of Transition Success: A Longitudinal Assessment" (Thomas E. Allen), presents a model for estimating the likelihood of transition "success" for individuals with specific educational and demographic characteristics. (Individual chapters contain references.) (DB)

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# Young Deaf Adults and the Transition from High School to Postsecondary Careers

by

Thomas E. Allen
Kay H. Lam (Principal Investigator)
Brenda W. Rawlings
Debra E. Rose
Arthur N. Schildroth

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## *Introduction*

Arthur N. Schildroth

The transition of deaf youth from high school to their postsecondary careers is a major concern of educators and rehabilitation professionals working with these young men and women. The 1990 annual report to Congress of the U.S. Department of Education included a long section on the "transition of secondary age students with handicaps" (Office of Special Education and Rehabilitative Services [OSERS], 1990, p. 77). In its 1992 annual report the Department discussed the problem of high school dropouts, indicating that the "seeds of a successful postschool transition for young people with disabilities are sown in secondary school" (OSERS, 1992, p. 108). Recent Department of Education regulations have recognized the importance of the high school transition process by requiring the inclusion of specific transition services within the Individualized Education Program (IEP) of students in special education by age 16 (*Federal Register*, September 29, 1992, p. 44814).

In an effort to learn more about the transition experiences of deaf high school students, in 1986 the Center for Assessment and Demographic Studies (CADS) in Gallaudet University's Research Institute began collecting transition-related data from the schools and from the students themselves, their parents, and their high school counselors. The basis for selecting the student sample was the Center's Annual Survey of Hearing Impaired Children and Youth, a national survey of deaf and hard-of-hearing students in special educational programs initiated in 1968 and including approximately 60% of all hearing-impaired children receiving special educational services in the United States. Thus, the final data base for the special CADS study included not only the transition information, but also demographic, audiological, and other educationally relevant data on the students.

The student sample was limited to deaf students — that is, those with a hearing threshold greater than 70 dB in the better ear — and to students in the 16 through 22-year-old age range. The results of the first phase of the CADS transition study dealt with the enrollment and exiting patterns of deaf high school students, their vocational training and employment while still in high school, assessment instruments used with deaf students in high school, and the involvement of state offices of rehabilitation in the transition process. These results were published in a book, *Deaf Students and the School-to-Work Transition* (Allen, Rawlings, & Schildroth, 1989). The book reflected four distinct data collection sources:

- Annual Survey of Hearing Impaired Children and Youth, 1985-86 School Year: demographic, audiological, and program data about each student;
- School Survey, January, 1987: information on the relationship between the student's high school program and state offices of vocational rehabilitation (VR);
- Student Questionnaire I, March, 1987: information concerning the student's employment while in high school — for example, type of job, hours worked, salary — and reception of services or benefits from VR and other state agencies;

- Counselor Questionnaire, March, 1987: data about the student's course work and vocational training in high school, including tracking procedures employed by the school and the program's relationship to state offices of rehabilitation.

One limitation of the original CADS transition study — imposed by the nature of the Annual Survey — was the fact that the data related to students still in high school. This is certainly a critical period, as the Department of Education's report cited above indicates. However, none of the post-high school transition experiences of these students could be investigated, including postsecondary education or employment outcomes.

The present monograph is an attempt to remedy this limitation of the original CADS project and to answer some of the questions raised in that study. It reports the results from a follow-up transition project in which the deaf students in the 1986-87 study with known home addresses were again contacted by mail and asked to respond to a questionnaire regarding their post-high school experiences. In addition, a sample of the parents of these students was requested to complete a survey asking about parental expectations, relationship with VR, and the general economic situation of the student's family. Thus, in addition to the data of the first transition study, the CADS researchers also had available to them information from the follow-up project:

- Student Survey II, June, 1988: information regarding employment, income, living accommodations, postsecondary education, and relationship with VR;

- Parent Survey, June 1988: data on parental education, occupation, and income; communication methodology within the home; parental relationship with VR and their perception of the assistance needed by deaf youth from VR.

However, on examination, the data from these two 1988 surveys were found to come largely from individuals still in high school. CADS therefore decided to wait several years before attempting to again make contact with the 1987 students. The following survey was the result:

- Student Survey III, July, 1991: similar to Student Survey II of June, 1988, with added information on number of jobs held since high school, relationship of high school coursework to present job, and satisfaction with that job.

A response rate of 22% resulted from this July, 1991, survey; a similar percentage of survey forms was returned as undeliverable. An abridged questionnaire was then developed and sent, in January of 1992, to the parents of individuals who had not responded to the first questionnaire, resulting in a total response rate of 26%. Readers will want to consider this response rate and the qualifications to generalizability resulting from it when reading the various chapters of this monograph. The individual authors generally indicate these qualifications in the course of their data analysis and in relation to the particular focus of their chapters.

Table 1 summarizes information about all surveys in the CADS transition project, including those in the first stage which resulted in the book, *Deaf Students and the School-to-Work Transition*.

*Table 1: Transition Study of Deaf Students, 1986-1992: List of Surveys, Dates Sent, and Response Rate*

| *Survey* | *Date* | *Number Sent* | *Number Returned* | *Response Rate* |
|---|---|---|---|---|
| Annual Survey | Jan 1986 | NA | | NA |
| School Survey | Jan 1987 | NA | | NA |
| Student Survey I | Mar 1987 | 8,285 | 6,196 | 75% |
| Counselor Survey | Mar 1987 | 5,895 | 4,513 | 77% |
| Student Survey II | Jun 1988 | 2,662 | 914 | 34% |
| Parent Survey | Jun 1988 | 2,662 | 903 | 34% |
| Student Survey III | Jul 1991 | 2,662 | 693* | 26% |
| *Includes 101 responses from parents as proxies for their deaf sons and daughters. | | | | |

Although the authors of this monograph had access to and made use of data from all of these surveys, the bulk of the analysis presented here involves the 693 respondents — 592 deaf youth and 101 parents — to "Student Survey III" of July, 1991, and the abridged parental survey of January, 1992. Table 2 compares the distribution of these 693 respondents on various demographic and educationally-related variables with that of the original target population within the 1985-86 Annual Survey data base, that is, deaf students in special education between the ages of 16 and 22.

If the "child count" disability numbers reported to the federal government each year by the states are accurate, then the Annual Survey collects information on approximately 60% of all deaf and hard-of-hearing children receiving special educational services across the United States. However, due to the fact that these federal "child count" figures are not broken down by demographic or audiological variables, it is not possible to say exactly how representative the original target population within the 1985-86 Annual Survey — as shown in Table 2 — is of all deaf students in the 16 thru 22-year-old age range. It can be said that the final group of 693 in the 1991 Student Survey III was, in comparison to the original target population of 8,285:

- less minority;
- more frequently enrolled in special schools, either residential or day;
- less integrated in both the special schools and in the local schools;
- more profoundly deaf; and
- reported to have fewer educationally significant additional disabilities.

*Table 2: Distribution of Demographic and Educational Variables: 1991 Transition Study and Original Target Population within 1985-86 Annual Survey of Hearing Impaired Children and Youth*

| | *Target Population (N=8,285)* | *1991 Transition Study (N=693)* |
|---|---|---|
| Region of Country: | | |
| Northeast | 21% | 20% |
| Midwest | 21% | 23% |
| South | 39% | 43% |
| West | 20% | 15% |
| Sex: | | |
| Male | 55% | 56% |
| Female | 45% | 44% |
| Race/Ethnic Background: | | |
| White | 64% | 73% |
| Black | 21% | 16% |
| Hispanic* | 11% | 6% |
| Other | 4% | 4% |
| School Type: | | |
| Special School | | |
| Integrated | 10% | 5% |
| Not Integrated | 47% | 59% |
| Local School | | |
| Integrated | 35% | 30% |
| Not Integrated | 7% | 7% |
| Degree of Hearing Loss: | | |
| Severe (71-90 dB) | 32% | 27% |
| Profound ( >90 dB) | 68% | 73% |
| Select Causes of Loss: | | |
| Maternal Rubella | 24% | 18% |
| Heredity | 11% | 13% |
| Meningitis | 8% | 8% |
| Additional Disabilities:** | | |
| None | 67% | 71% |
| One Additional | 21% | 21% |
| Two or More Additional | 12% | 9% |
| Select Disabilities: | | |
| Mental Retardation | 11% | 7% |
| Blind/Visual | 9% | 7% |
| Learning Disability | 8% | 7% |
| Emotional/Behavioral | 7% | 5% |
| Cerebral Palsy | 4% | 4% |

* Hispanics may be of any race.
** "Additional Disabilities" refer to those conditions that are educationally significant.

The authors of the chapters in this monograph attempt to point out the relevance of these differences to their particular chapter topics.

Chapter 2 discusses the transition experience of those who did not receive any postsecondary education — their demographic characteristics, employment status and types of jobs held, wages, sources of job acquisition, and satisfaction with their employment.

Chapter 3 of this monograph reports data on postsecondary educational experiences of the large number of students in the follow-up transition project who entered an educational program after high school: for example, demographic characteristics of these individuals, types of programs entered, reasons reported for matriculating at a particular program, subject majors, and relationship of their postsecondary education to employment.

Chapter 4 concentrates on the involvement of state offices of rehabilitation in the postsecondary careers of the survey respondents: whether and how often VR services were provided, kinds of services provided, satisfaction of respondents with VR assistance, and relationship of parental transition concerns to the actual provision of VR services reported by deaf youth.

Chapter 5 studies correlations between high school achievement test scores and certain high school practices (e.g., tracking) and between test scores and later postsecondary outcomes (e.g., employment); this chapter also relates the test scores to presence of additional disabilities of the survey respondents.

Finally, Chapter 6 analyzes the school and demographic characteristics related to transition experiences generally accepted as successful, and, as a conclusion to the monograph, presents a model for estimating the likelihood of transition "success" for individuals with these different characteristics.

### *References*

Allen, T., Rawlings, B., & Schildroth, A. (1989). *Deaf students and the school-to-work transition*. Baltimore, MD: Paul H. Brookes Publishing Co.

*Federal Register*. (1992, September 29). Part II, Assistance to states for the education of children with disabilities programs and preschool grants for children with disabilities; Final rule. Vol. 57, No. 189, 44814-44815.

Office of Special Education and Rehabilitative Services. (1990). *Twelfth annual report to Congress on the implementation of The Education of the Handicapped Act*. Washington, DC: Department of Education.

Office of Special Education and Rehabilitative Services. (1992). *Fourteenth annual report to Congress on the implementation of The Individuals with Disabilities Education Act*. Washington, DC: Department of Education.

## *Non-College-Bound Deaf Youth*

Kay H. Lam

Abstract

*This chapter examines the transition experiences of 233 young deaf adults who had not attended a postsecondary program after leaving high school. They are a group from the transition study conducted by the Center for Assessment and Demographic Studies at Gallaudet University between 1986 and 1991.*

*Results show that about one half of this group participated in the labor force. A majority held blue-collar jobs, earned above minimum wage, and were generally satisfied with their jobs. Deaf youth with multiple disabilities worked fewer hours per week, earned lower hourly pay, and were employed in service-type occupations more than those without additional disabilities, even though they had a higher employment rate due, in large part, to professional assistance in job placement. A majority of these deaf youth with other disabilities received vocational training while in high school, but only a small number worked while they were in school or participated in the Job Partnership Training Act or in apprenticeship type programs which could provide them with the opportunity to develop employable job skills.*

In the following chapter Rawlings discusses the advantages associated with training beyond high school. As our society becomes more technologically advanced, employers need more highly trained staff. Studies have shown that those receiving additional training have higher employment rates, are employed more often in professional/administrative types of occupations, earn higher pay, and report higher employment satisfaction (Bowen, 1977; Rawlings, 1984; Welsh & Walter, 1988; Welsh & Walter, 1989; Welsh, Walter, & Riley, 1989). In view of these positive employment outcomes and the increased accessibility to postsecondary training programs since the passage of the Americans with Disabilities Act of 1990, deaf students have been encouraged to take advantage of postsecondary training opportunities. However, not every deaf student is able to enter postsecondary training. Those who are poor or academically low-achieving and those with special needs often do not have the opportunity to pursue education after high school. Even with those deaf youth who do attend postsecondary programs, Walter, Foster, and Elliot (1987) estimate that 70% exit without a degree. The question arises, therefore, how those deaf youth with no postsecondary training fare after they leave high school. Is there a difference in employment experiences between those receiving such training and those who do not?

This chapter examines the responses of the deaf respondents who, at the time of the second follow-up survey in 1991, had not received any postsecondary training—the non-college-bound deaf youth. These non-college-bound deaf individuals constitute about one third (34%) of the sample of 693 deaf youth who responded to both the original survey

in 1987 and the second follow-up survey in 1991. At the time of the 1991 survey, they were between 22 and 27 years of age. All of them had severe to profound hearing losses. One of the major differences between this group of non-college-bound deaf youth and those who received postsecondary training is in the area of additional educationally significant disabilities, that is, the existence of physical or cognitive/behavioral conditions requiring modification of teaching methods in an instructional setting. Forty-seven percent of this group of non-college-bound deaf respondents had multiple disabilities, compared with 20% for those who received postsecondary training. As Figure 1 indicates, the most frequently reported additional disabilities were cognitive/behavioral in nature—mental retardation, emotional/behavioral problems, and learning disabilities. The most prevalent physical conditions were uncorrected visual problem, including legal blindness, and cerebral palsy.

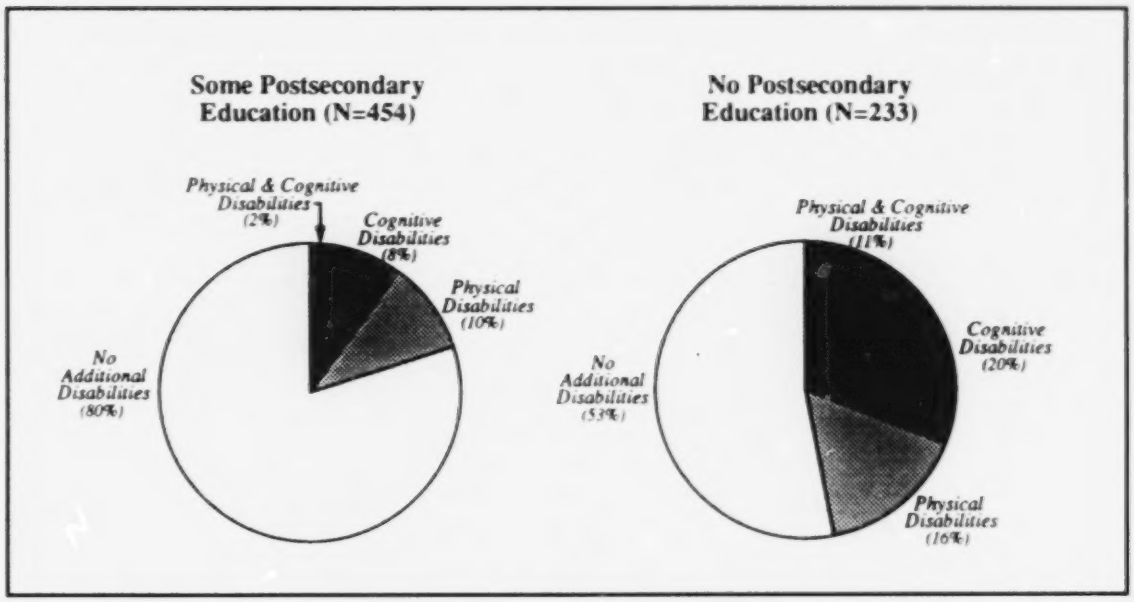


*Figure 1.* Comparison of additional disabilities among deaf youth, transition study, 1987-1991.

The following questions will be addressed in this chapter:

- What percentage of these non-college-bound deaf youth was able to secure jobs after leaving high school, and what kinds of jobs?
- What percentage worked full-time, and what were their hourly wages?
- Is there any association between vocational training and employment, between work experience while in high school and employment?
- What were the reasons for those unemployed not looking for jobs?

Employment Status

At the time of the 1991 survey all of the 693 respondents had left high school. A majority (66%) had gone on to receive postsecondary training. Among the 233 who did not receive postsecondary training, 54% worked either part-time or full-time.

Table 1 shows the association of certain demographic characteristics of the non-college-bound deaf youth with their employment status. Older deaf youth, that is, those 24 years or older, were more likely to be employed than those in the 23 and younger age bracket. A higher percentage of males (65%) than females (41%) participated in the labor force. Whites (58%) were more likely to be working than minorities (49%); and deaf youth with additional educationally significant disabilities other than deafness were slightly more likely to be employed (58%) than those with no additional disability (52%).

The latter finding was somewhat surprising. Why were deaf youth with multiple disabilities more likely to be employed than those without such disabilities? Did they also do better than those without additional disabilities in terms of the number of work hours per week and of hourly wages? The subsequent analysis will include a discussion of the employment experiences of deaf youth with multiple disabilities, including types of occupations held, number of work hours per week, hourly wages, and job satisfaction.

*Table 1. Employment Status of Non-College-Bound Deaf Youth (N=233)*

| | *Currently Employed* | *Currently Unemployed* |
|---|---|---|
| Age: | | |
| 23 years and under | 51% | 49% |
| 24 years and over | 61% | 39% |
| Sex: | | |
| Male | 65% | 35% |
| Female | 41% | 59% |
| Ethnic Background: | | |
| White | 58% | 42% |
| Minority | 49% | 51% |
| Additional Disabilities: | | |
| No additional disabilities | 52% | 48% |
| Multiple disabilities | 58% | 42% |
| Years out of High School: | | |
| Less than four years | 49% | 51% |
| Four years or more | 67% | 33% |

## Types of Jobs Held by Non-College-Bound Deaf Youth

A large majority (72%) of the employed non-college-bound deaf youth held blue-collar jobs. About 54 different job titles were reported. The five most frequently reported were: clerk/typist (19%), kitchen worker (17%), packager/laborer (9%), janitor/cleaner (8%), and assembler (8%).

"Clerk/typist" — including computer data entry functions — was most frequently reported among whites, females, those with no additional disabilities, those who were out of high school for more than three years, and those 23-years-old and younger. "Kitchen worker" was the most frequently reported occupation for males, minorities, those with multiple educationally significant disabilities, and those out of high school less than four years. "Janitor/cleaner" ranked first among the five job categories for the 24-year and older group.

## Hours of Work Per Week

Slightly over one half (51%) of the employed non-college-bound deaf youth worked 40 or more hours a week. Twenty-five percent worked 20 hours or less a week; the remaining 24% worked between 21 and 39 hours a week.

*Table 2. Number of Hours Worked Per Week by Non-College-Bound Deaf Youth*

| | *N* | % | *10 or less hrs/wk* | *11-20 hrs/wk* | *21-39 hrs/wk* | *40 or more hrs/wk* | *Mean # hrs/wk* |
|---|---|---|---|---|---|---|---|
| Age: | | | | | | | |
| 22-23 years | 77 | 100 | 10% | 12% | 21% | 57% | 33 |
| 24 and older | 44 | 100 | 14% | 16% | 29% | 41% | 30 |
| Sex: | | | | | | | |
| Male | 81 | 100 | 12% | 11% | 21% | 56% | 32 |
| Female | 40 | 100 | 10% | 17% | 30% | 43% | 31 |
| Ethnic Background: | | | | | | | |
| White | 84 | 100 | 4% | 14% | 26% | 56% | 35 |
| Minority | 37 | 100 | 30% | 11% | 19% | 40% | 25 |
| Additional Disabilities: | | | | | | | |
| None | 60 | 100 | 7% | 12% | 8% | 73% | 36 |
| One or more | 61 | 100 | 16% | 15% | 39% | 30% | 28 |
| Years out of High School: | | | | | | | |
| Less than 4 years | 58 | 100 | 14% | 10% | 29% | 47% | 31 |
| 4 years or more | 38 | 100 | 13% | 13% | 21% | 53% | 32 |

Table 2 shows that older deaf respondents, that is, those 24 and older, worked fewer hours than those who were 23 and younger. Of those aged 24 and older, 41% worked full-time, compared with 57% of the 23 and younger group. Males were more likely to work full-time than females. Whites worked longer hours than minority groups. Only 4% of the whites worked less than 10 hours, compared with 30% of the minorities. Deaf youth with no additional educationally significant disabilities were more likely to work full time than those with one or more added disabilities: 73% of those with no additional disability worked 40 or more hours a week, compared with only 30% of those with multiple disabilities.

Hourly Wages

The overall mean hourly wage of the employed non-college-bound deaf youth was $5.77. Only 14% earned less than minimum wage, which was $4.25 per hour as of April 1, 1991.

Table 3 shows that older deaf youth reported less hourly pay than did younger deaf respondents. Of those 23-years-old and under, 93% reported earning above minimum wage, compared with 73% of those aged 24 and older. Males reported slightly higher pay than females. Although a higher percentage of males (16%) than females (9%) earned less

*Table 3. Hourly Wages of Non-College-Bound Deaf Youth*

| | *N* | *%* | *Less than $4.25* | *$4.25-$5.99* | *$6.00 or more* | *Mean hourly wages* |
|---|---|---|---|---|---|---|
| Age: | | | | | | |
| 22-23 years | 69 | 100 | 7% | 48% | 45% | $5.92 |
| 24 and older | 37 | 100 | 27% | 32% | 41% | $5.49 |
| Sex: | | | | | | |
| Male | 74 | 100 | 16% | 38% | 46% | $5.83 |
| Female | 32 | 100 | 9% | 53% | 38% | $5.64 |
| Ethnic Background: | | | | | | |
| White | 73 | 100 | 9% | 40% | 51% | $6.22 |
| Minority | 33 | 100 | 24% | 49% | 27% | $4.79 |
| Additional Disabilities: | | | | | | |
| None | 59 | 100 | 5% | 39% | 56% | $6.48 |
| One or more | 47 | 100 | 25% | 47% | 28% | $4.89 |
| Years out of High School: | | | | | | |
| Less than 4 years | 51 | 100 | 8% | 45% | 47% | $5.74 |
| 4 years or more | 34 | 100 | 24% | 41% | 35% | $5.64 |

than minimum wage, the mean hourly wage for males was $5.83, compared with $5.64 for females. Whites were more likely to earn higher hourly wages than minorities. Ninety-one percent of the whites received at least minimum wage, compared with 76% of the minority group. The mean hourly wage for whites was $6.22; for the minority group it was $4.79, a difference of $1.43. Deaf youth with no additional educationally significant disabilities were more likely to earn higher hourly wages ($6.48) than those with multiple disabilities ($4.89), a difference of $1.59 per hour.

There was a negative association between length of time out of high school and hourly wages. Among the non-college-bound deaf respondents who were out of high school for less than four years, 92% reported earning minimum or above minimum wage, compared with only 76% of those who were out of high school four years or more. Those who were out of high school less than four years earned a mean hourly wage of $5.74, while those out of high school four or more years earned $5.64 per hour, a small difference possibly due to the fact that older respondents did not stay on the same job very long or changed jobs often within blue-collar job categories. This possibility is reinforced by the fact that, of those out of high school four years or more, 42% changed jobs at least three times since leaving high school, compared with only 21% of those out of high school less than four years.

How Did Respondents Obtain Their Current Job?

Thirty percent of those non-college-bound deaf youth who were working at the time of the 1991 survey reported that they located their jobs themselves. Twenty-three percent found jobs with the help of families and friends. The rest (47%) relied on professionals such as high school staff, vocational rehabilitation counselors, and placement agencies to help them find jobs. Those with multiple disabilities were more likely to rely on professionals to help them get jobs (55%) than those without such disabilities (33%).

A higher percentage of the 23-and-under deaf youth (47%) reported obtaining their current jobs with professional assistance, compared with 39% of the 24-and-over deaf youth.

Of the minority group, 60% reported that they obtained their current jobs with the assistance of professionals, compared with 37% of the whites.

Job Satisfaction

The employed non-college-bound deaf youth were generally satisfied with their jobs. Specifically, the greatest satisfaction was reported in their work relationship with co-workers and supervisors (87% and 83%, respectively), in the duties of the job (77%), and in their on-the-job training (74%) (see Table 7 in the chapter by Rawlings). Whites, males, and those with multiple disabilities reported greater satisfaction in their work relationship with co-workers; females reported greater satisfaction in their work relationship with supervisors.

The least satisfaction was reported in the categories of wages (60%), benefits (55%), and promotion possibility (54%). Since most of the non-college-bound deaf respondents were employed in service kinds of occupations, such as kitchen workers and janitors, the wages were minimal, with little hope of promotion. Also, almost one half (47%) of them worked part-time, a category often not covered by benefits.

Vocational Training

Vocational training has traditionally been part of the curriculum designed to train students for specific job skills in schools for the deaf (Schildroth, 1986), thus providing deaf students with marketable job skills after high school. It is a training especially vital for those youth who receive minimal or no postsecondary education.

Seventy-six percent of the non-college-bound deaf youth received vocational training in high school, but the percentage employed is only slightly higher than those who did not receive vocational training in high school (56% versus 53%).

A slightly higher percentage of males (81%) reported receiving vocational training while in high school than females (74%). There was only a small disparity in the percentage of vocational training received between whites and minority groups, with a slightly higher precentage of the minority groups having received vocational training (80% versus 77%). Youth with multiple disabilities were more likely than those without additional disabilities to have received vocational training (82% versus 74%).

The most frequently reported vocational training area in high school was food occupations (28%). Other areas reported for at least 10% of deaf respondents included computer related fields (23%), home economics (17%), office work (13%), automotive trades (13%), and construction trades (10%).

Work Experience While in High School

Studies have found that paid employment while in high school provides advantages to the transition experience of disabled youth—for example, introduction to actual work settings, skills, responsibilities and roles needed when entering the work world, and expansion of social contacts (Hasazi, Gordon, & Roe, 1985; Will, 1985).

Hasazi, Gordon, & Roe (1985) found a positive correlation between student's paid employment during school and their employment status after school. The CADS transition data indicate that 29% of the non-college-bound deaf respondents worked while they were in high school. Of those who worked while in high school, 69% were employed after they left high school, compared with 49% of those who did not work while in high school.

A higher percentage of males reported holding jobs while in high school than females (36% versus 19%). White students (30%) worked more frequently in high school than did minority groups (27%). Those with no additional educationally significant disabilities were more likely to work while in high school (36%) than those with multiple disabilities (23%).

Unemployed Non-College-Bound Deaf Youth

Forty-five percent of the non-college-bound deaf youth were unemployed at the time of the second follow-up survey. When they were asked if they were searching for employment, 70% reported that they were not looking for jobs, giving as reasons that there were no jobs available (38%), no one helped them get jobs (24%), or they did not want to lose Supplemental Security Income (24%).

Almost three fourths (73%) of the unemployed respondents requested help from the state vocational rehabilitation (VR) agencies. A majority (68%) indicated they were not satisfied with the VR services, their greatest complaint being that VR was not helpful in finding employment.

## Discussion

At the time of the second follow-up survey in 1991, all of the non-college-bound deaf respondents had left high school. About half of them were working either part-time or full-time. Most (72%) held blue-collar jobs, for example, kitchen workers, packagers/laborers, janitors/cleaners, assemblers, and so forth. A majority (86%) earned above the minimum wage, which was $4.25 as of April 1, 1991. Whites and males, in comparison to minorities and females, had higher employment rates, worked longer hours, and earned higher hourly wages. Those with multiple educationally significant disabilities had a higher employment rate than those without additional disabilities, due, in large part, to the professional assistance of VR, high school counselors, and other professionals in job placement. However, fewer than one third of those with multiple disabilities worked full-time, earning $1.59 less per hour than those without additional disabilities; also a higher percentage of this multiple disability group was employed in service type occupations, such as kitchen workers and janitors/cleaners.

In examining the association between age and labor force participation, between age and hourly wages, and between age and the number of hours worked, the transition data show that there is a positive association between age and labor force participation. However, a higher percentage of the younger (i.e., age 23-and-under) deaf youth worked full-time; they also earned higher hourly wages. Furthermore, a higher percentage of the 23-and-under group was employed as clerk/typists, while more of the 24-and-older group worked as janitors/cleaners, probably accounting for the higher wages. One possible explanation for this phenomenon is that there is a larger percentage of those 24-years-old and older with multiple educationally significant disabilities than among the younger group.

A large majority of the non-college-bound respondents (88%) received vocational training while in high school. However, the employment rate for those with vocational training was only slightly higher than the rate for those without such training. The difference is not statistically significant, and little relationship was found between training areas in high school and occupations held after high school. This finding prompts a question about the effectiveness of secondary vocational training programs. For non-college-bound deaf youth needing employable skills to help them secure jobs after leaving high school vocational training can be an important part of the transition process.

If the vocational courses within high school are not effective in producing skilled workers, are there other, perhaps better, ways of obtaining these skills?

According to the U.S. Department of Labor (1987), jobs in manufacturing are diminishing as a result of the continuing shift from industrial to high-tech work. Employers are seeking workers who are computer literate, in addition to being skillful in reading and mathematics. On-the-job experience is one of the best ways to learn vocational skills. This employment experience introduces students to the skills, responsibilities, and roles they will need when they enter the job market in search of full-time employment (Allen, Rawlings, & Schildroth, 1989.) It provides hands-on, real-life learning which relates to what the student is doing in school. Work experience, especially paid jobs in partnership programs between schools and community-based businesses, provides even more benefits of interaction between learning in school and practice of skills outside of school. Many of the non-college-bound deaf youth encounter difficulties with academic coursework, and work experience can enable them to demonstrate achievement. This experience of achievement is vital in the development of self-esteem and motivation (Rusch, Mithaug, & Flexer, 1986). Yet, only 29% of the non-college-bound deaf youth in this transition study worked while in high school. Only 6% participated in the Job Partnership Training Act, 1% in an apprenticeship program. Schools need to have an effective evaluating system to identify and place students in the appropriate tracks, provide those who are academically weak with an effective program which integrates applied academics with vocational training, and offer guidance counseling and vocational training in areas which reflect job market needs. Schools also need to form partnerships with local companies offering students opportunities to be exposed to a real-life work environment — for example, through apprenticeships — and to encourage employers to familiarize teachers with the demands of the workplace and its high skill requirements.

## Conclusion

Traditionally, the goal of high school education is to prepare students for productive lives—to obtain good jobs and lead satisfying and independent lives. Emphasis has been placed on the development of reading, writing, and computation skills. Some deaf youth who have achieved academically go on to postsecondary education, to be trained in professional areas. Others, especially those with multiple educationally significant disabilities, may not be able to enter postsecondary programs. For this group of deaf youth, vocational and on-the-job training becomes very important. They should be given the opportunity to receive training in employable skills through early identification, tracking, effective vocational training, and on-the-job experience while they are still in high school.

Non-college-bound deaf youth in general and those with multiple educationally significant disabilities in particular are of special concern to state VR agencies. These young adults may not have marketable job skills to become gainfully employed. VR counselors must work closely with high school staff to develop appropriate transition plans for <u>all</u> deaf youth, but that work is doubly important for those not planning on the more formal postsecondary education of a college or university. The transition plans for these young non-college-bound deaf individuals may include a variety of job-related experiences: for example, job training, apprenticeships, and work experience

opportunities—such as those provided by the Job Partnership Training Act. This group of deaf youth need to experience the success which they are often unable to achieve in more strictly academic areas.

### *References*

Allen, T., Rawlings, B., & Schildroth, A. (1989). *Deaf students and the school-to-work transition*. Baltimore, MD: Paul H. Brookes Publishing Co.

Bowen, H.R. (1977). *Investment in learning*. San Francisco, CA: Jossey-Bass.

Hasazi, S., Gordon, L., & Roe, C. (1985). Factors associated with the employment status of handicapped youth exiting high school from 1979 to 1983. *Exceptional Children, 51*, 455-469.

Rawlings, B. (1984). *Gallaudet College alumni survey*. Washington, DC: Gallaudet College, Center for Assessment and Demographic Studies.

Rusch, F., Mithaug, D., & Flexer, R. (1986). Obstacles to competitive employment and traditional program options for overcoming them. In W.E. Kiernan & J.A. Stark (Eds.), *Pathways to employment for adults with developmental disabilities* (pp. 7-21). Baltimore, MD: Paul H. Brookes Publishing Co.

Schildroth, A. (1986). Residential schools for deaf students: A decade in review. In A. Schildroth & M. Karchmer (Eds.), *Deaf children in America* (pp. 83-104). San Diego, CA: College-Hill Press.

U.S. Department of Labor (1987). *Monthly Labor Review*, September (Special issue on the year 2000).

Walter, G. G., Foster, S. B., & Elliot, L. (1987). *Attrition and accommodation of hearing-impaired college students in the U.S.* Paper presented at the Tenth National Conference of the Association on Handicapped Student Service Program in Postsecondary Education. Washington, DC.

Welsh, W. A., & Walter, G. G. (1988). The effect of postsecondary education on the occupational attainments of deaf adults. *Journal of the American Deafness and Rehabilitation Association, 22*(1), 14-22.

Welsh, W. A., & Walter, G. G. (1989). Providing deaf people with the opportunity for a degree: Benefits to individual and society. *Journal of the American Deafness and Rehabilitation Association, 23*(1), 7-13.

Welsh, W. A., Walter, G. G., & Riley, D. (1989). *Earnings of deaf college alumni in the United States*. Rochester, NY: Office of Postsecondary Career Studies and Institutional Research, National Technical Institute for the Deaf at Rochester Institute of Technology.

Will, M. (1985). Bridges from school to working life. *Rehabilitation/WORLD, 9*(1), 4-7, 42-43.

## *Postsecondary Education: Its Impact and Outcomes*

Brenda W. Rawlings

Abstract

*This follow-up study of deaf youth in transition from high school to work confirms earlier studies indicating that deaf youth enroll in postsecondary educational programs at rates similar to their hearing peers. Two thirds of those responding indicated they were either currently enrolled in a postsecondary program or had some previous postsecondary educational experience. A description of the post-secondary educational opportunities available to deaf youth is provided. For the population currently under study, nearly one half had attended a four-year college or university program. The major factors for choosing a particular program were the specific majors offered and the provision of special support services. The most frequently reported majors were "Business" and "Computer & Information Sciences" programs. Certain demographic and educational background factors were related to whether youth went on to postsecondary education; these factors included ethnic background, age, additional disabilities, parental education status, and students' secondary education back-ground. Over one half (55%) of those with some college experience were employed at the time of the follow-up survey. This group showed generally more positive attitudes toward their employment situation than the deaf youth in the study who did not have any postsecondary educational experience. These data indicate deaf youth do have access to postsecondary educational programs and are taking advantage of these opportunities.*

For many individuals, exiting secondary education programs has been viewed as the termination of one's educational training. Today, as we look toward the 21st century, learning is viewed much more as a lifelong process (Clinton, 1993). This change in perspective can be attributed to many factors: changes in local economies as well as the fact that our nation increasingly is becoming part of a larger, more global economy; societal factors which have brought more women into the labor force where previously many were full-time homemakers; longer and healthier life spans, thus permitting individuals to remain in the labor force for additional years; the expansion of educational opportunities making training more accessible to persons at all stages of their adult life.

Deaf individuals are increasingly affected by these same economic and societal forces. In addition, postsecondary training and degree programs have become more available to deaf individuals. This chapter will look at some of the issues associated with postsecondary education as it relates to deaf persons. First, some reasons for pursuing a postsecondary education will be discussed; and second, the current status of postsecondary training opportunities for deaf persons will be highlighted. Finally, using the CADS

Transition Study sample, we will see how deaf persons compare to the general population in terms of training beyond high school. Among the questions to be addressed are: What demographic characteristics are related to whether or not deaf youth continue their education beyond high school? Are deaf students who hold jobs while in high school more likely to continue their education after leaving their secondary education program? Finally, do those deaf students with additional training get better jobs and earn higher salaries than their peers who do not have this postsecondary training?

Reasons for Obtaining Postsecondary Training

Postsecondary education may permit individuals to be at an advantage in entering the job market. It may help them advance in their current career, enable them to be more mobile and better able to change career paths when prudent, or simply keep them up-to-date in the technological changes required to perform their current job responsibilities.

Recent economic factors have made the need for additional training urgent for some. With changes in the economy, certain jobs have become obsolete. For example, in the printing industry the production process has been greatly streamlined with the use of computers and other high technology equipment. The economic slowdown experienced in the United States over the last 15 years has also led to the closing of numerous manufacturing plants and employment reductions in certain industries. Thus, for many workers the need for additional postsecondary training results from the need to retrain and learn new skills to function in a current position or to adapt their existing skills to new careers.

The more education an individual has, the more likely he or she is to find employment. The employment rates for the civilian population 25 years of age and older clearly show a positive relationship with years of school completed (U.S. Bureau of the Census, 1991). For example, only 1.8% of those in the labor force with 5 years or more of college were unemployed. Among those who graduated with 4 years of college, the unemployment rate was 2.4%. For persons with 1 to 3 years of college the unemployment rate rose to 3.2%; and for persons whose highest year of school completed was high school, 4.5% were unemployed.

Another reason for postsecondary training is that the labor market has become increasingly more competitive. The actual number of persons competing for jobs in the labor market has risen. Population growth certainly contributes to the increased numbers, but other factors also increase the competition. Over the last 20 years there has been an increase in the number of women in the labor market (U.S. Bureau of the Census, 1991). In 1970, there were 31.5 million women in the labor force. By 1989, this number had nearly doubled to 56 million. While the number of men in the civilian labor force stood at 51.2 million in 1970, the number grew to 67.8 million by 1989. Women continue to break ground by entering into fields traditionally viewed as male dominated.

As our society becomes more technologically advanced, the skill levels required to perform certain jobs also become more specialized, and employers need more highly trained staff. This also has an impact on the competition for jobs. Obviously, those with more training beyond high school will be better able to meet the requirements for these

positions. Today's labor force is better educated than ever before. In 1940 only 4% of the 25 and older population had completed four or more years of college; in 1988, 20% of the population age 25 and older had completed this level of education (U.S. Bureau of the Census, 1989). In 1970, only about one fourth (26%) of the civilian labor force had completed one year or more of college; by 1989, this figure had risen to 46% (U.S. Bureau of the Census, 1991).

With proposed U.S. military cutbacks projected this decade, over 400,000 persons who would have entered or continued their military service will be joining the civilian labor force over a 4-year period (U.S. Department of Education, 1992). This will be another factor increasing competition for existing jobs in the civilian sector. The Department of Education suggests that those most severely affected by this influx of former military personnel into the labor market will be those already in the labor force who have fewer job skills and less advanced training than the new entrants with military service.

The economic advantage associated with training beyond high school is another reason many individuals continue their education. With only a few exceptions, the more advanced a degree one has, the more likely that individual is to earn higher wages (Kominski & Sutterlin, 1992; "Column One," 1992). Kominski and Sutterlin report the average monthly earnings in 1990 of workers with some college but no degree was $203 more than the average salary of workers who completed only high school. Those with vocational training beyond high school earned $160 more; an associate degree meant an additional $595 per month in earnings, and this figure jumped to $1,039 for those with a bachelor's degree.

Postsecondary Education Opportunities

Formal educational programs at colleges and universities, continuing education classes offered by community organizations, on-the-job training, televised courses, and independent study courses are only a few of the options available for acquiring this training beyond high school. Individuals may avail themselves of these options continuously throughout their lives or at certain points during their careers. In the area of education, the United States is recognized as one of the world leaders in postsecondary education (Kantrowitz & Wingret, 1991). This is especially true when one considers the postsecondary educational opportunities available to deaf and hard-of-hearing persons. Since 1865, when the first liberal arts college for deaf students was established, the U.S. has provided postsecondary educational training to deaf persons. While the opportunities were limited for nearly 100 years to those offered at Gallaudet College (now Gallaudet University), today deaf and hard-of-hearing students in the United States attend over 150 different colleges, universities, and technical programs offering a wide variety of courses.

The "America 2000" plan proposed by the Bush Administration set goals for educational improvement in the U.S. and for "revitalizing education." The Assistant Secretary for the Office of Special Education and Rehabilitative Services stated that these goals apply to disabled persons as well (Davila, 1991). Those parts of the plan which may impact on the field of postsecondary education for deaf persons include the goal of attaining a 90% high school graduation rate. If this goal is reached, certainly more deaf youth will qualify for admission to postsecondary education programs.

In addition, among the strategies proposed for achieving educational excellence is the emphasis on education being considered a life-time experience rather than limited to one's youth. This expanded view of education will certainly increase the applicant pool if older deaf individuals are encouraged to apply and enroll in advanced training programs.

The passage of the Americans with Disabilities Act in 1990 also has made a more recent impact on the accessibility of educational opportunities for deaf and hard-of-hearing persons. Now choices for educational training need not be limited to those programs with special programs for deaf students. Rather, all programs must make their services accessible to persons with disabilities; colleges and universities may not discriminate on the basis of disability.

Current Programs for Deaf Students and Changes over 10 Years

The number of programs providing support services to deaf and hard-of-hearing students has grown in recent years, and the way these services are provided has also been evolving. The main source of data used for this review is the Survey of Postsecondary Programs for Deaf Students conducted by the National Technical Institute for the Deaf (NTID) and Gallaudet University. Initiated in 1975, the survey is conducted at regular intervals, and program information is tabulated by the Center for Assessment and Demographic Studies (CADS) at Gallaudet University.

When the original survey of postsecondary programs was conducted and the first directory published (Stuckless & Delgado, 1973), the programs included were basically defined as "special programs for deaf students." These programs typically enrolled a minimum number of deaf students and had an administrator who devoted significant time to the program. With changes in legislation, increased awareness of the needs of disabled persons, and technological advances, deaf and hard-of-hearing persons now have other options available to them. For example, many universities have established "Offices for Disabled Student Services" where students with various disabilities can request support services. With the growth of such offices, some "special programs for deaf students" have been blended into these more generic offices, and separate programs for a single group of students no longer exist; these institutions, however, continue to enroll deaf students and provide needed support services.

The eighth edition of the book, *College and Career Programs for Deaf Students*, lists 152 programs in the United States which currently enroll deaf students and provide special services (Rawlings, Karchmer, DeCaro, & Allen, 1991). Table 1 compares the number of these programs and their enrollments over a 10-year period.

Not only has the number of programs offering specialized services to deaf students grown from 58 to 152 over the 10-year period, but there has been a substantial increase in the number of deaf and hard-of-hearing students attending these programs, from 4,883 to 8,070, a 65% increase. The largest percentage increase has come in the part-time enrollments at these programs. The part-time enrollments at the two national programs have more than tripled, from 34 students to 127; at the regional programs the part-time enrollments have almost doubled, expanding from 75 to 144. Similarly, the number of

*Table 1. Comparison of Types of Programs and Enrollments at Postsecondary Institutions Serving Deaf Students, U.S., 1980 and 1990*

| | 1980 | | 1990 | | |
|---|---|---|---|---|---|
| *Program Type* | *Number of Programs* | *Enrollment* | *Number of Programs* | *Enrollment* | *% Change in Enrollment* |
| National Programs: | 2 | | 2 | | |
| Full-time | | 2,043 | | 2,952 | 44% |
| Part-time | | 34 | | 127 | 274% |
| Regional Programs: | 4 | | 4 | | |
| Full-time | | 441 | | 617 | 40% |
| Part-time | | 75 | | 144 | 92% |
| State & Local Programs for Deaf Students: | 52 | | 146[a] | | |
| Full-time | | 1,844 | | 2,351 | 27% |
| Part-time | | 446 | | 1,111 | 149% |
| Office Serving Students with Various Disabilities: | | | | | |
| Full-time | | * | | 516 | ** |
| Part-time | | * | | 252 | ** |

[a] Eight of these programs are affiliated with the Regional Postsecondary Educational Consortium at the University of Tennessee, Knoxville.

* Only programs specifically serving deaf students were included in the survey.

** Unable to compute as 1980 data not available.

deaf and hard-of-hearing students attending state and local programs part-time more than doubled, increasing from 446 to 1,111.

With changes in technology and a heightened awareness of the special needs of deaf and hard-of-hearing students, there has been an increase in the services offered at postsecondary programs to facilitate students' educational experience, as shown in Table 2. Some of the support services were offered at a large majority of programs, for example, Interpreted Classes (82%) and Personal Counseling services (81%). Other specialized high technology services, such as Real-time Captioning, were available at only 6% of the programs. The availability of services is directly related to program size, that is, the number of deaf students enrolled (Walter, 1991). Those programs with the larger number of deaf students enrolled are more likely to provide comprehensive support services.

*Table 2: Support Services Available at Programs Serving Deaf Students, 1990*

| *Services* | *Percent of Programs Providing Service* |
|---|---|
| Interpreters in Classes Taught by Instructors Not Fluent in Sign | 82% |
| Personal Counseling | 81% |
| Notetaking | 80% |
| TDDs in Office of Program for Deaf Students | 80% |
| Tutoring | 78% |
| Employment Placement | 76% |
| Sign Language Training for Hearing Students | 76% |
| Vocational Development | 75% |
| Amplified Phones | 69% |
| In-service Training for Faculty/Staff | 64% |
| Sign Language Training for Deaf Students | 62% |
| TV Decoders | 61% |
| Sign Language Training for Instructors | 60% |
| Remedial/Preparatory Program | 57% |
| Clinical Speech & Hearing | 55% |
| Diagnostic Speech & Hearing | 54% |
| Social/Cultural Activities | 53% |
| Emergency Visual Signal Devices | 46% |
| Group Listening Devices in Classrooms | 38% |
| Special Classes for Deaf Students | 29% |
| Group Listening Devices in Auditorium | 29% |
| Supervised Housing | 27% |
| TDDs at Admission's Office | 23% |
| TDDs at Central Switchboard | 15% |
| Captioned Closed Circuit TVs | 15% |
| Real-time Captioning | 6% |

CADS Transition Study Population

In 1991 CADS surveyed 2,662 individuals who had previously been enrolled in a high school program for deaf students. Information was received from 693 severely and profoundly deaf youth who had left high school and were able to provide information on their activities four years after CADS' initial contact in 1987. Of these respondents, two thirds (456) indicated they were currently enrolled in a postsecondary educational program or had attended such a program at some point since leaving high school. It is this group of deaf individuals who will be highlighted in this section of the monograph. Previous sections of this chapter discussed the need for postsecondary educational training and the advantages it may bring; this section will examine the demographic characteristics of those deaf youth who attended postsecondary programs and those who did not. Differences and similarities in employment status, types of occupations, and attitudes about employment will be highlighted for these two groups.

*What types of postsecondary programs did these youth attend, and why did they choose particular programs?*

Nearly one half of the youth who attended a postsecondary program reported being enrolled at a 4-year college or university (Figure 1). Just over a quarter of the youth attended a 2-year college; 17% went to a vocational technical school.

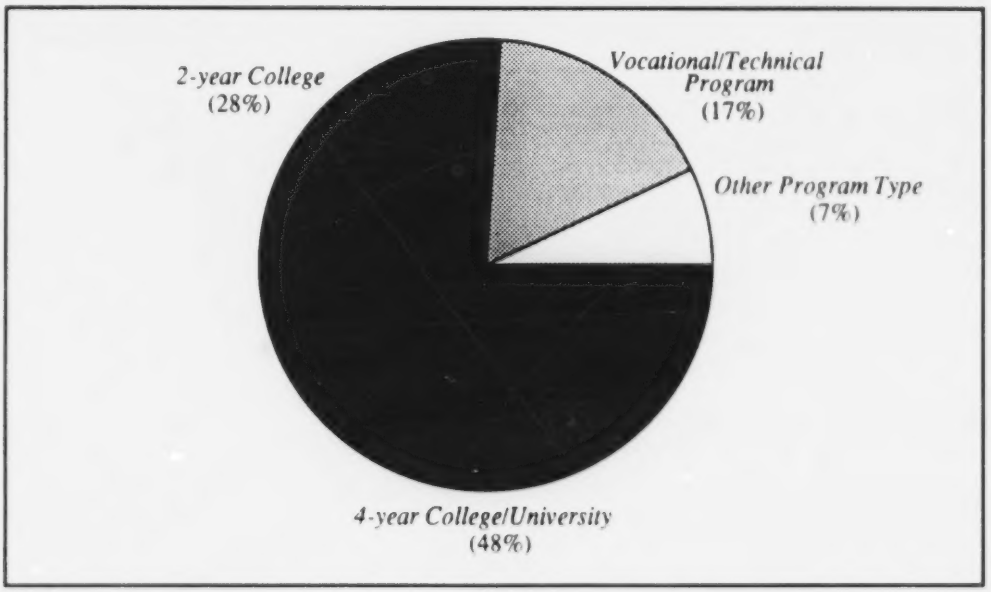


*Figure 1.* Type of postsecondary program attended by deaf youth in transition study.

The most frequent reason given for selecting a particular postsecondary program was that the school had a specific major or course of instruction the youth wanted to study; over one half of the youth (57%) indicated this reason (Table 3). Other important factors in the selection process were provision of special support services (50%), reputation of the program (38%), and enrollment of other deaf students at the school (34%).

*Table 3: Reasons Given for Selecting a Specific Postsecondary Program.**

| *Selection Criteria* | *% of Respondents (N=390)* |
|---|---|
| Program/Majors Offered | 57% |
| Provision of Special Services | 50% |
| School's Reputation | 38% |
| Enrollment of Other Deaf Youth | 34% |
| Advice from High School or VR Counselor | 31% |
| School's Proximity to Home | 29% |
| Advice from Family and/or Friends | 26% |
| Provision of Scholarship/Financial aid | 20% |
| Wanted to be with Friends | 17% |
| Parents Attended Same School | 3% |

*Responses total more than 100%, as multiple reporting was possible.

*What subjects do deaf youth major in at postsecondary programs?*

Although one fourth of the respondents had not declared or did not report a major, those who did provide this information indicated a wide variety of instructional programs as their focus. The most frequently reported majors are shown in Table 4.

*What demographic characteristics are related to whether deaf youth continue their education beyond high school?*

The deaf youth who attended a formal education program since leaving high school differed on a number of variables from their peers who left high school but had not received any formal postsecondary education. (Some of these differences have been touched upon in a previous section.)

*Table 4. Most Frequently Reported Majors*

| *Instructional Program* | *Number of Students* |
|---|---|
| Business | 82 |
| Computer & Information Sciences | 39 |
| Trade & Industrial | 34 |
| Education | 26 |
| Engineering | 19 |
| Visual & Performing Arts | 15 |

Table 5 compares several demographic and educational characteristics of those deaf youth who had some postsecondary education experience with those of the non-college-bound youth. Age was related to training, in that the younger the deaf individual, the more likely he or she was to have some postsecondary experience; 70% of the 22-year-olds had postsecondary education experience, compared to only 27% of those 26 years and older. Differences in ethnic background were also noted; white youth were more likely to obtain additional training than black or Hispanic individuals. Equal percentages of males and females had some postsecondary training.

Those respondents with no additional educationally significant disabilities (74%) were more likely to enroll in postsecondary programs than those with additional disabilities (45%). Those from local schools and those integrated with hearing students within the high school setting attended postsecondary programs at higher rates than those from special schools and those not integrated with hearing students. Parental education status also differentiated the postsecondary enrollees from those who had not gone on to such a program; in general, those whose mother and/or father had some college training or had graduated from college were more likely to enroll in a postsecondary program.

*What is the employment status of those with some postsecondary training?*

At the time of the 1991 follow-up survey, the youth were involved in various work and/or scholastic pursuits (Figure 2). When comparing the employment status of those youth with some postsecondary training to the non-college-bound deaf youth, it is interesting to note that for both groups 46% were not employed at the time of the 1991 survey. However, as seen in Figure 2, 29% of the unemployed youth with some postsecondary education were attending a postsecondary program, either full- or part-time. On the other hand, only 17% of those with some postsecondary training were neither in school nor working at the time of the survey.

*Table 5: Comparison of Characteristics on Selected Variables by Attendance at Postsecondary Programs*

| *Demographic Variable* | *N* | *Percent Attended Postsecondary Program* | *Percent Did Not Attend Postsecondary Program* |
|---|---|---|---|
| Age: | | | |
| 22 years | 280 | 70% | 30% |
| 23 years | 241 | 71% | 29% |
| 24 years | 107 | 60% | 40% |
| 25 years | 39 | 49% | 51% |
| 26 years and older | 26 | 27% | 73% |
| Ethnic: | | | |
| White, non-Hispanic | 504 | 70% | 30% |
| Black | 112 | 48% | 52% |
| Hispanic | 44 | 52% | 48% |
| Sex: | | | |
| Male | 384 | 66% | 34% |
| Female | 307 | 66% | 34% |
| Additional Educationally Significant Disability: | | | |
| None | 489 | 74% | 26% |
| One or More | 202 | 45% | 55% |
| High School Attended: | | | |
| Residential/Day School for Deaf | 435 | 61% | 39% |
| Local School | 213 | 78% | 22% |
| Integration with Hearing Students in High School: | | | |
| Not Integrated | 453 | 58% | 42% |
| Integrated | 239 | 81% | 19% |
| Mother's Highest Grade Completed: | | | |
| Non-high school graduate | 65 | 48% | 52% |
| High school graduate | 129 | 67% | 33% |
| Some college, but non-graduate | 84 | 74% | 26% |
| College graduate | 83 | 76% | 24% |
| Father's Highest Grade Completed: | | | |
| Non-high school graduate | 79 | 54% | 46% |
| High school graduate | 106 | 69% | 31% |
| Some college, but non-graduate | 65 | 72% | 28% |
| College graduate | 99 | 75% | 25% |

Just over one quarter (28%) were working but not currently in school; 26% were in school full-time and not working. Another 27% were working and attending school: 20% were in school full-time and 7% part-time. For the group that was neither currently in school nor working, the majority indicated they were unemployed but looking for work. For the small number not looking for work, their reasons included staying at home to care for children or other family members, lack of employment options, or frustration trying to obtain jobs.

Those working and going to school full-time were more likely to be employed in a professional occupation (28%) than either those attending school on a part-time basis or those not enrolled in a postsecondary program at the time of the survey (Table 6). Those going to school full-time worked fewer hours than those going to school part-time or those not currently in school; just over one third (35%) of those full-time students who were working were employed for 40 hours or more per week, compared to 59% of the part-time students and 65% of the youth not currently attending a postsecondary program.

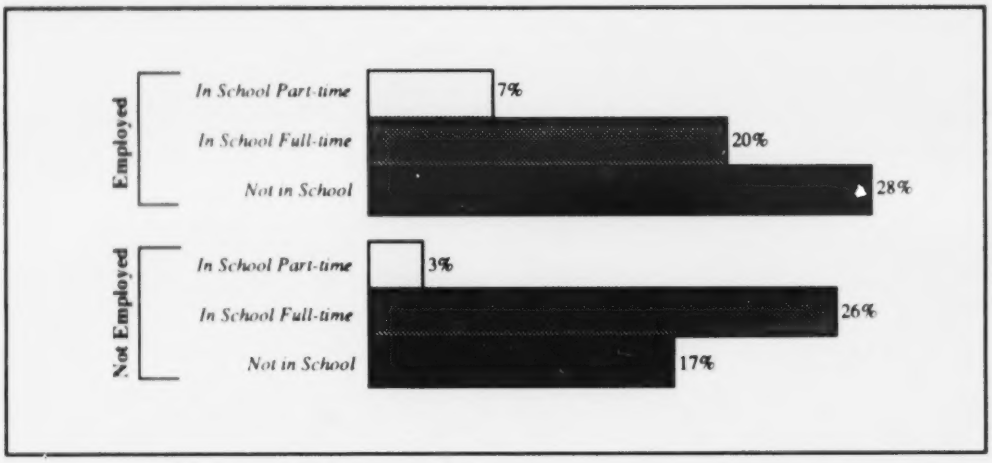


*Figure 2.* Employment status and postsecondary school attendance of deaf youth in transition study.

*Do those with postsecondary school experiences have more positive attitudes about their jobs than those who lack such training?*

In the transition survey deaf youth were asked a series of questions related to their employment experiences and levels of satisfaction with their jobs (Table 7). Just over one half of the youth who had some postsecondary educational experience were employed at the time of the survey. For those employed, a higher percentage of those who attended a postsecondary program reported being satisfied with factors related to employment than deaf youth who did not have postsecondary training. While high percentages of youth in both groups indicated high levels of satisfaction, the largest

*Table 6: Selected Employment Variables According to Current Postsecondary School Attendance.*

| *Selected Employment Variables* | *In School Full-time / Working (N= 76)* | *In School Part-time / Working (N=26)* | *Not Currently in School / Working (N=108)* |
|---|---|---|---|
| Type of Occupation: | | | |
| Professional | 28% | 8% | 9% |
| Administrative Support | 42% | 46% | 43% |
| Operators/Laborers | 8% | 15% | 11% |
| Employed 40 hrs. or more per week | 35% | 59% | 65% |
| Mean hourly wage | $6.24 | $5.29 | $6.01 |

*Table 7: Percentage of Respondents Satisfied with Selected Employment Issues*

| *Employment Issue* | *Attended Postsecondary Program (N=207)* | *Did Not Attend Postsecondary Program (N=102)* |
|---|---|---|
| Co-workers | 90% | 87% |
| Supervisor | 87% | 83% |
| Job duties | 86% | 77% |
| On-the-job training | 80% | 74% |
| Communication at work | 79% | 73% |
| Pay | 77% | 60% |
| Promotion possibilities | 60% | 54% |
| Benefits | 56% | 55% |

differences were noted on pay and job responsibilities. Over three fourths (77%) of those with postsecondary educational training reported being satisfied with their salary, compared to 60% of those who did not attend a postsecondary program. When asked about levels of satisfaction with job duties, 86% of those with postsecondary training were satisfied, compared to 77% of those without such training. Respondents in both groups were least satisfied with their job benefits, for example, health insurance, vacation.

## Summary

The data presented here reveal that deaf youth currently do have access to postsecondary educational opportunities and that many of them are participating in the programs. Their access has been greatly enhanced by the growth of specially designed programs for deaf students as well as the passage of the Americans with Disabilities Act, which insures that all colleges and universities, public and private, must provide disabled persons with access to their facilities and services.

While for many years postsecondary participation was restricted because of limited resources, over the last two decades deaf student enrollment in postsecondary educational programs has greatly increased. In fact, deaf students are enrolling at rates similar to those of hearing youth. Some previous studies (Armstrong & Schneidmiller, 1983; Kerstetter, 1985; White, Karchmer, Armstrong, & Bezozo, 1983) cited comparable enrollment rates, and these more current data support these findings. For example, the National Center for Education Statistics (1990) reports that in 1988, 11% of youth 16 to 24 years old enrolled in 2-year programs and 26% of youth in this age range enrolled in 4-year colleges. In the CADS transition survey, 8% of the youth in this age range were enrolled in 2-year colleges (11% if vocational/technical program enrollments are included) and 20% of the youth were enrolled in 4-year college programs.

The value of additional postsecondary training in terms of added income has often been emphasized for the general population. Studies by Welsh and Walter (1986) reported that for deaf youth enrolled at the National Technical Institute for the Deaf the level of the degree obtained was significantly related to the salaries earned. They also found that NTID graduates earned 44% more than those students who withdrew from NTID. This also appears to be the case for the CADS transition survey. The median hourly wage for youth with postsecondary training, but not currently enrolled in school, was $6.01 an hour and even higher, $6.24 an hour, for those working and going to school full-time. Those not attending a postsecondary program — discussed in Chapter 1 — earned $5.77 an hour.

Wages are not the only measure, however, of employment satisfaction. On some other employment components evaluated, those with postsecondary training consistently reported higher levels of satisfaction with their job than did those who did not have postsecondary training.

The concern exists that the data discussed here may reflect the more successful youth and therefore some bias may be evident in the data. One limitation of the 1991 survey was it did not contain questions on graduation or completion rates at post-secondary programs. Some of the survey population are still in transition and may be continuing the pursuit of their education; others may have withdrawn from a post-secondary program in which they enrolled and this information was not collected. In general, college students are tending to take longer than the customary two or four years to complete a course of instruction. In 1977, 40% of all students enrolled attended part-time; in 1997, this figure is projected to increase to 45% (National Center for Education Statistics, 1988). For many, the economic costs of a postsecondary education require them to work either full- or part-time and to attend school on a part-time basis, thus

lengthening the amount of time to complete the program. It is important to know the retention rates for these deaf youth and to know the numbers successfully completing programs.

Changes in the economy will create more pressures in the job market. Deaf youth and many deaf adults who never had an opportunity to attend college must continue to be encouraged to take advantage of the wide spectrum of postsecondary training opportunities now available. This responsibility lies with those within the secondary educational programs, vocational rehabilitation agencies, and the postsecondary programs themselves.

### *References*

Armstrong, D., & Schneidmiller, K. (1983). *Hearing impaired students enrolled in U.S. higher education institutions: Current status of enrollments and services.* (Institutional Studies Report 83-3). Washington, DC: Gallaudet College.

Clinton, W.J. (1993, February 24). Excerpts from President Clinton's address to Congress. *Education Week*, pp. 26-27.

Column one. (1992, 16 September). *Education Week*, p. 6.

Davila, R.R. (1991). A message from the assistant secretary. *OSERS News in Print*, *4*(1), 1.

Kantrowitz, B., & Wingret, P. (1991, December 2). The best schools in the world. *Newsweek*, pp. 50-52.

Kerstetter, P. (1985). *Demographic predictors of postsecondary program choice of hearing impaired secondary school students.* Unpublished doctoral dissertation, Gallaudet College, Washington, DC.

Kominski, R., & Sutterlin, R. (1992). *What's it worth? Educational background and economic status: Spring 1990* (Bureau of the Census Report CPS P70-32). Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics. (1988). *Projections of education statistics to 1997-98.* (NCES CS88-607). Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics. (1990). *The condition of education 1990: Postsecondary education.* (NCES 90-684). Washington, DC: U.S. Government Printing Office.

Rawlings, B. W., Karchmer, M. A., DeCaro, J., & Allen, T. E. (1991). *College and career programs for deaf students.* Washington, DC: Gallaudet University.

Stuckless, E. R., & Delgado, G. L. (1973). *A guide to college/career programs for deaf students.* Rochester, NY: National Technical Institute for the Deaf.

U.S. Bureau of the Census. (1989). *Population profile of the United States: 1989* (Series P-23, No. 159). Washington, DC: U.S. Government Printing Office.

U.S. Bureau of the Census. (1991). *The statistical abstract of the United States: 1991* (11th ed.). Washington, DC: U.S. Government Printing Office.

U.S. Department of Education. (1992). *Military cutbacks and the expanding role of education*. (Number 065-000-00545-0). Washington, DC: U.S. Government Printing Office.

Walter, G. (1991). Adherence of postsecondary programs to the CEASD: Principles basic to the establishment and operation of postsecondary education for deaf students. In E.G. Wolf-Schein & J.D. Schein (Eds.), *Postsecondary education for deaf students* (pp. 16-26). Edmonton: University of Alberta.

Welsh, W. A., & Walter, G. G. (1986). *Earnings of deaf RIT graduates as reported by the Internal Revenue Service*. Unpublished manuscript, National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY.

White, C., Karchmer, M., Armstrong, D., & Bezozo, C. ( 1983). Current trends in high school graduation and college enrollment of hearing impaired students attending residential schools. *American Annals of the Deaf, 128*, 125-131.

## *Rehabilitation and the Transition of Young Deaf Adults*

Arthur N. Schildroth

Abstract

*The transition study of young deaf adults conducted by the Center for Assessment and Demographic Studies at Gallaudet University between 1986 and 1991 included questions regarding the involvement of state offices of vocational rehabilitation (VR) in the transition process. The following chapter reports and discusses data in four different areas linked to this relationship between VR and deaf youth.*

*The first area concerns the provision of rehabilitation services. Did VR generally respond to requests for assistance from the young deaf men and women in the study? Did the study reveal any misunderstandings by deaf youth regarding the role and services of VR in their transition from high school? A second area explored in this chapter involves the kinds of services provided by VR to deaf youth. Do these services correspond to the ultimate goal of VR aid, namely, succcessful job placement?*

*The third section of this chapter discusses the satisfaction or dissatisfaction of deaf youth with the assistance provided by VR, and a fourth section compares the specific VR assistance reported by deaf respondents in this study to the transition concerns expressed by parents of deaf youth. The conclusion of the chapter attempts to weave these four areas into a coherent pattern and makes several recommendations regarding the work and services of state offices of rehabilitation in the transition of deaf youth from high school to their postsecondary careers.*

There has been a broad consensus regarding the importance of state offices of vocational rehabilitation (VR) in the successful transition of young deaf adults from high school into their postsecondary careers. Educators, rehabilitation professionals, and government officials have all stressed the significance for the transition process of collaboration among deaf students, their families and schools, and state offices of rehabilitation (e.g., Johnson, Bruininks, & Thurlow, 1987; Will, 1985; Wright, 1989). The Center for Assessment and Demographic Studies (CADS) has presented the results of a 1986-87 transition study of deaf high school students, including their relationship with VR, in a 1989 book, *Deaf Students and the School-to-Work Transition*, and in several journal articles and presentations (Allen, Rawlings, & Schildroth, 1989; Allen, Schildroth, & Rawlings, 1990; Rawlings, Schildroth, & Allen, 1989; Schildroth, Allen, & Rawlings, 1989; Schildroth, Rawlings, & Allen, 1991). Due to survey participant constraints, one limitation of these previous reports was their concentration on transition experiences of deaf students within the high school setting.

A follow-up transition project, conducted by CADS between June, 1988, and January, 1992, surveyed students from the original study in an attempt to learn, among other things, details of their contact with VR during the years following high school. A series of questions was asked about this contact: whether VR assistance was provided, types of assistance received from VR, especially job training and job placement, reasons for satisfaction or dissatisfaction with VR services, provision of VR services in relation to parents' perceptions of the needs of their deaf sons and daughters.

As indicated in the introduction to this report, the follow-up transition questionnaire was sent to a total of 2,662 individuals, all former students in schools contacted in the original transition study. Of this total, 693 responded to the survey questionnaire, a response rate of 26%. (This includes 101 responses to an abbreviated questionnaire by parents of sons or daughters who did not respond to the first mailing of the follow-up study.) A description of the demographic, audiological, and educational characteristics of these 693 respondents has been given in the introduction to this study.

This chapter will present results from the follow-up transition project and its questions regarding VR. It will address the following issues:

1. Did the young deaf adults in this study receive assistance from their state offices of vocational rehabilitation?
2. What kinds of assistance did they receive from VR? If, as a former president of the American Deafness and Rehabilitation Association has written, the "main goal of vocational rehabilitation is successful job placement for the individual" (Wright, 1989, p. 56), how many of the youth in this study obtained their jobs through the assistance of VR?
3. What reasons were most cited by these individuals for their satisfaction/ dissatisfaction with VR?
4. How did the actual assistance received from VR meet the concerns of parents regarding the needs of their deaf daughters and sons?

A discussion will follow the data presented for each of these questions, and a general conclusion will summarize the VR-related findings of the CADS follow-up transition study and make some specific recommendations related to these findings.

## Provision of Rehabilitation Services

### Data Presentation

One question in the follow-up transition study inquired about the response of VR to requests for assistance. Of the 519 respondents who requested some kind of aid from their state offices of rehabilitation, a large majority (84%) indicated they had received some assistance.

Several qualifications to this overwhelmingly positive response should be noted. First, there is the fact that 16% of the 519 young deaf adults who asked for assistance indicated they did not receive services from VR — a relatively small percentage. However, a second qualifier is that, of those who did receive assistance, 37% indicated

they were not satisfied with those services. Thus, a significant number of those requesting aid from VR either did not receive assistance or responded that they were dissatisfied with the assistance they did receive.

Discussion: Provision of Rehabilitation Services

The question of dissatisfaction with VR services will be discussed more fully later in this chapter. However, it should be noted here that, although 37% of those receiving some VR assistance indicated they were not satisfied with those services, the reasons given for their dissatisfaction often raise serious questions about how well some young deaf adults understand VR, especially its eligibility requirements and the services it can provide.

Examples of apparent misunderstanding may be found in the specific comments made by survey respondents regarding their dissatisfaction with VR. These written comments include such remarks as the following: "VR did not pay for my rent," "VR would not pay for my pregnancy," "[VR was] kind of personal or nosy." The last comment is especially illustrative of the misinformation that can arise. As Wright (1989) has made clear, the VR counselor is required to collect information in 10 different areas of the client's life in order to establish the eligibility of that individual for VR services. These areas include such matters as "patterns of work behavior," "vocational and social adjustment," and "personal considerations" (Wright, 1989, p. 55). Certainly, these are aspects of one's life which are not generally divulged to strangers; and it is understandable how a client, unsure of or unfamiliar with VR requirements, might consider the counselor "nosy" for asking them. However, VR must ask these questions in order to establish the client's eligibility for rehabilitation services — a concept very different, as Wright points out, from the "entitlement" to primary and secondary school services the client has previously experienced.

## Kinds of Assistance Provided by VR

Data Presentation

Another question on the post-high school survey asked about the types of assistance received from VR. The information reported in the follow-up survey for this question confirms data reported by the schools in the original transition study by CADS. By far the most frequently reported aid given by state offices of rehabilitation to young deaf adults in both the original 1986 transition survey of the schools and in the 1991 survey of former students of these schools was "money for [postsecondary] school." In the latter study, financial assistance for school was reported by 56% of the 437 individuals who received assistance from VR.

"Advice and counsel" (33%) and "provision of various services, for example, TDD, interpreters, etc." (30%) were the next most often reported services. Of the eight specific kinds of VR assistance respondents could select on the survey form, job placement and job training ranked sixth and seventh — at 19% and 16%, respectively.

Discussion: Kinds of Assistance Provided by VR

Given "successful job placement" as the main goal of VR assistance (Wright, 1989, p. 56), it is, at first glance, somewhat disconcerting to find job placement and job training being reported so infrequently in the follow-up survey.

However, this emphasis by the respondents on financial aid for postsecondary schooling, with a correspondingly low number of responses for job placement and training, is very probably due to the select nature of the 693 respondents in this sample. A very large majority, 89%, graduated from high school with a diploma rather than a certificate. Consequently, there is the expectation that many of them would enter postsecondary programs and apply for financial aid from VR. This expectation is borne out by the fact that 70% of these "diploma graduates" reported they had enrolled in some type of post-secondary program. (In contrast, only 38% of those graduating with a certificate entered a postsecondary program.) Thus, financial aid for school was the type of assistance most cited by these young deaf adults in the follow-up transition study because it was the kind of aid they had requested from VR.

It should be noted here that there was an imbalance in the racial/ethnic composition of those reporting financial aid from VR for postsecondary education; 80% of these individuals were from a white, non-Hispanic background and only 20% minority. These percentages differ from both the original CADS 1987 transition study in which 35% were reported as minority and from the total 1991 follow-up survey with its 27% minority composition.

One specific ethnic group not well represented among those obtaining financial aid for postsecondary schooling was Hispanic youth. Less than 5% of those in the 1991 survey reported receiving financial assistance from VR for postsecondary education. Data from other studies show the Hispanic group, with depressed reading and mathematics achievement test scores (Allen, 1986; Holt, 1993) and as members of families with generally less favorable economic situations (U.S. Bureau of the Census, 1991, 1993), probably had few opportunities to enroll in postsecondary educational institutions and consequently would be less likely to make requests for financial assistance from VR for postsecondary education. This probability is reinforced by U.S. government figures showing Hispanics in the general population having a lower percentage, 44%, of individuals with high school diplomas than either whites, 19%, or blacks, 32% (U.S. Bureau of the Census, 1992). In the 1991-92 Annual Survey, only 50% of the 375 Hispanic hearing-impaired children who had departed from their 1990-91 high school graduated with a diploma, the lowest of any racial/ethnic group; 18% were dropouts, the highest by a considerable margin of any group (Schildroth & Hotto, 1993), a finding replicated at the national level by the U.S. Bureau of the Census for both Hispanic males and females (National Center for Education Statistics, 1990; see also Rumberger, 1987).[1]

## Satisfaction/Dissatisfaction with VR Services

### Data Presentation

As indicated earlier, a majority of the survey respondents (63%) indicated they were satisfied with the assistance they received from state offices of rehabilitation; 37% reported they were not satisfied. The survey also asked for the reasons for their satisfaction/dissatisfaction. (Write-in comments — the type of response required by this question — involve a certain amount of subjectivity, both on the part of the survey respondent and on the part of those trying to interpret and categorize these comments; that limitation should be kept in mind when reading this section.)

Provision of financial assistance for postsecondary education was by far the most frequently reported reason for satisfaction with VR assistance, being indicated by one third of the 171 respondents to this particular question. (Financial aid was also indicated by a small group of satisfied respondents who did not specify the purpose of this aid.) Other reasons for satisfaction either were stated vaguely — for example, "very helpful," "good relationship," "met needs" — or were scattered within several different categories. Only 11% of the respondents reported assistance from VR in finding a job as the main reason for their satisfaction.

It is somewhat ironic that the financial assistance issue was also at the top of the list of the dissatisfied respondents, reported by 32% of the 112 individuals in this group. Though not specified in every instance, this complaint centered largely on the lack of financial aid for postsecondary education or training. Failure of VR to assist in finding a job was the next most reported reason for dissatisfaction (29%), followed by delays/long waits in receiving VR assistance (22%). (The words "waiting," "long waits," and "slow process" appear frequently in the write-in comments of these dissatisfied respondents.) Problems with communication or finding an interpreter were reported by 12% of the dissatisfied respondents.

### Discussion: Satisfaction/Dissatisfaction with VR Services

The responses to the question regarding satisfaction with VR services follow logically from the type of assistance most often reported by the respondents, that is, financial aid for postsecondary education. As would be expected, a large majority (71%) of the 209 individuals responding to this question expressed their satisfaction with that financial aid.

Unlike the New York state study of Joyce and Mathay (1986) which found problems with communication a major complaint against VR, dissatisfaction associated with this issue was fourth on the list of the CADS respondents, reported by 12%. Analysis of all the dissatisfied respondents did not reveal any major demographic anomalies in the distribution of this group — for example, in regard to sex, ethnic background, additional disabilities, or family economic situation. However, the refusal of VR to provide financial aid for postsecondary education may well have resulted from the judgment by the VR counselor that the client was not a suitable candidate for such education, either in terms of capability or in terms of a particular postsecondary program being viewed by the VR counselor as an unlikely avenue to employment for an individual.

## Parental Concerns and VR Assistance

### Data Presentation

The importance of family in the transition of deaf students from high school to a postsecondary career has been widely recognized in the literature on this subject. It would seem appropriate, therefore, to learn how the actual services provided by VR correspond with the perceptions of parents of deaf students regarding the transition needs of young deaf adults.

In the 1988 transition study a parental survey was conducted that included a question regarding the transition services needed by deaf youth from state offices of rehabilitation. In this section the responses of the parents to this question in 1988 will be matched with the actual assistance reported being received from VR by deaf respondents — not necessarily the children of these parents — in the 1991 survey.

Parental concerns regarding deaf youth centered on jobs; job placement (39%) and job training (35%) were the two services most frequently cited by the 670 parents responding to this question. Career counselling and financial assistance were in third place in their list of transition needs, each being cited by 29% of the parents' group.

In contrast, as we have already seen in the section describing the kinds of assistance provided by VR, job placement (19%) and job training (16%) ranked low — sixth and seventh out of eight possible choices — on the list of services provided to the deaf respondents of the 1991 survey.

### Discussion: Parental Concerns and VR Assistance

At the very least, there appears to be a mismatch between the principal transition concerns of the parents of deaf youth and the actual aid received by young deaf adults from VR. This mismatch raises the potential for misunderstanding between VR and the families of young deaf adults — that is, between what parents expect from state offices of rehabilitation and the actual services their sons and daughters receive from VR.

Part of the discrepancy between parental concerns and the VR aid reported by deaf youth in this study is undoubtedly due to the demographic and educational characteristics of the deaf respondents to the 1991 CADS follow-up survey. As mentioned above, these respondents were largely from a white, non-Hispanic ethnic background. Almost 90% graduated with a diploma, not a certificate; two thirds had enrolled in a formal education program after high school. It is not exceptional, therefore, that the most frequently reported assistance from state offices of rehabilitation in this study is financial aid for postsecondary education.

Parents, on the other hand, often focus on the final goal of transition services — that is, job placement and independent living. They view postsecondary education as a means to that goal. The critical issue for them involves whether the financial aid for school results in stable and remunerative employment for their deaf sons and daughters.

Although this mismatch between actual aid given by VR and the perceptions of parents can be explained by the limitations of the CADS follow-up survey, it does raise an important question about the final employment outcome for those deaf youth receiving financial aid from VR for postsecondary education. Does that aid and the postsecondary education resulting from it lead to gainful employment, which is, as we have seen, the main goal of VR services? A discussion of this question will follow in the conclusion to this chapter.

## Conclusion

The data reviewed in this chapter and the discussions following each section raise several issues about the relationship between state offices of rehabilitation and young deaf adults in their passage from high school to their postsecondary careers.

### Misunderstanding of VR

The data regarding the response of VR to requests for services revealed a very large majority of the respondents (84%) reporting that VR had provided some assistance. However, this positive response was qualified by the fact that a large number (34%) of those receiving VR assistance indicated they were dissatisfied with that assistance.

This last response pattern regarding dissatisfaction was, in turn, qualified by the fact that some of the dissatisfied recipients of VR aid appeared not to understand that there are eligibility requirements for receiving that assistance, that VR does not usually pay for contingencies unrelated to employment (e.g., pregnancy), and that the VR counselor must ask certain rather personal questions in order to establish a client's employability status.

What conclusions can be drawn from this complex interplay of response patterns? First, the CADS transition follow-up study paints a generally favorable picture of VR in terms of actual provision of services, at least for the type of deaf youth responding to the CADS follow-up survey, that is, those entering postsecondary programs. Second, although there was a fairly substantial number of dissatisfied recipients of these services, some of this dissatisfaction appears to result from a misunderstanding of VR eligibility requirements.

Unfamiliarity with or misunderstanding of VR eligibility regulations makes the intervention of rehabilitation counselors at an early time in the high school career of deaf students of special importance. Such timely involvement of VR in meetings with the student, the family, and school staff during the high school years offers the VR counselor an opportunity to explain rehabilitation services and to dispel any misunderstandings on the part of the student or the student's family. It enables VR to clarify federal or state regulations — for example, reading level needed in order for a client to qualify for financial aid for postsecondary schooling and how this reading level will be determined (by high school grades? by achievement test scores? and if by testing, which test — the Stanford, the Gates-MacGinitie?). Opportune intervention by VR in the high school setting — Wright (1989) has suggested as early as 9th grade — also allows parents to become involved in the transition process and to clarify their own understanding of VR's

eligibility requirements. Once a deaf student has left the high school environment, contact with state offices of rehabilitation will almost always depend on the knowledge and initiative of the deaf individual or the family of that individual, a somewhat chancy situation.

The potential for misunderstanding of VR services by deaf youth also emphasizes the importance of the Individualized Written Rehabilitation Plan (IWRP) in the transition process. Like early VR intervention in a student's high school career, the IWRP enables the rehabilitation counselor to clarify in writing exactly what services VR can provide for the client, on what basis, and under what conditions — the eligibility factor again. Although the follow-up CADS data show no apparent positive correlation between the existence of an IWRP and job acquisition — see Chapter 6 — this does not lessen the importance of the IWRP for diminishing family and student misunderstanding regarding the role of VR in the transition process.

The two potential obstacles to clients' understanding of the role of VR in the transition process discussed in the previous paragraph — delayed intervention by VR in the high school and absence of a student IWRP — may be reduced by recent regulations promulgated by the Department of Education. These regulations — implementing P.L. 101-476, the *Individuals with Disabilities Education Act* (IDEA, Part B) — require that development of plans for the post-high school transition period of disabled students be included in the student's Individualized Education Program (IEP) by age 16 (or even earlier for some students). The new rules also require that planning meetings for the transition period be arranged with the student, the family, and involved professionals, including a representative of any "agency. . . likely to be responsible for providing or paying for transition services" (*Federal Register*, September 29, 1992, p. 44814). If these regulations, effective as of December 20, 1992, are implemented consistently, they may reduce some of the misunderstanding by deaf clients and their families regarding VR services.

Minorities, Non-College Bound, Dropouts, and VR

A second issue raised by the CADS follow-up transition study concerns the relationship of VR with minorities, with those not going on to postsecondary education, and with those who have dropped out of high school — groups often overlapping in the CADS data. How well is VR serving these deaf youth?

It is difficult to answer that question unequivocally from the data reported in this chapter. This is due largely to the selective nature of the individuals in the CADS 1991 follow-up study, which was a survey of deaf youth after they had left high school. The group of 2,662 deaf youth in the original 1987 CADS transition study had dwindled to 693 in the 1991 survey. Of these 693 respondents, 456 (66%) had enrolled in a postsecondary educational program after high school — considerably higher than the 30% to 53% postsecondary enrollment pattern for deaf high school graduates reported in other studies (Armstrong & Schneidmiller, 1983; Kerstetter, 1985; White, Karchmer, Armstrong, & Bezozo, 1983).

The result is that the CADS 1991 follow-up data have been reported mainly — and disproportionately — from enrollees in postsecondary programs. As Table 1 indicates,

these enrollees had certain demographic, educational, and VR-related characteristics quite different from those deaf youth who had not entered a postsecondary program.

The 456 enrollees were, in comparison to the non-enrollees, less minority and more often graduates from high school with a diploma; they solicited and received assistance from VR recipients more often, specifically financial assistance for postsecondary schooling. In terms of family income, only 5% of these postsecondary enrollees came from families whose income in 1987 was less than $7,500 per year. They were, in short, very good candidates for postsecondary education. Not surprisingly, they requested financial aid for that education from VR; and, for the most part, they received that assistance.

In contrast, the 233 deaf respondents to the follow-up survey who did not enter a postsecondary program were, as Table 1 makes clear, a different group of respondents from the postsecondary enrollees described in the previous paragraph, especially in terms of their high school education and in their solicitation and reception of VR services, whether of financial aid for school or of other VR assistance. (As Table 1 shows, it appears that a small number of those not going on to postsecondary education reported that they had also received VR aid for that purpose.) In regard to family income, 19% of those not going on to postsecondary schooling came from families earning less than $7,500 during 1987, that is, below the U.S. poverty level, which, for a family of 4 in 1987, was $11,611 (U.S. Bureau of the Census, 1990) — another difference from the postsecondary enrollees described earlier.

*Table 1: Comparison of Characteristics of Postsecondary Enrollees and Non-Enrollees: 1986-1991 Deaf Youth Transition Study*

| | *Postsecondary Enrollees (N = 456)* | *Non-Postsecondary Enrollees (N = 233)* |
|---|---|---|
| Minority | 22% | 35% |
| High School Diploma Graduates | 94% | 78% |
| Requested VR Assistance | 84% | 67% |
| Received VR Assistance | 74% | 45% |
| VR Financial Aid for School | 52% | 5%* |
| Family Income < $7500 | 5% | 19% |

* A small number of the "non-postsecondary enrollees" reported they received financial aid for school, even though they also reported not having received any postsecondary education.

The point of this discussion is not that VR is failing to serve minorities or dropouts or those graduating from high school with a certificate. The CADS follow-up survey of post-high school deaf youth and its non-representative sample may well suggest a larger problem: that is, the difficulty of establishing or maintaining contact between VR and certain families, especially minority or disadvantaged families

- who move frequently;
- who have English as a second language in the home and therefore have difficulty understanding the legal or technical language employed in VR regulations;
- who probably have few of the "connections" that often lead to stable employment (Granovetter, 1983).

Ironically, it is these very groups that are often in most need of VR services.

This problem of contact — and maintaining contact — emphasizes, in its own way, the importance of the early intervention by VR in the high school career of deaf students, especially of minorities, dropouts, and non-diploma graduates. It is interesting to note that the new federal regulations cited in a previous section of this chapter mention specifically the problem of high school dropouts as one reason for a transition plan being included in the student's IEP even earlier than the age 16 written into the new federal regulations.

In the CADS transition study VR assistance often involved financial aid for postsecondary education because that was the service requested; and the groups able to take advantage of this were largely those who knew how to make use of the system and had the knowledge and contacts to use the system legally and appropriately. The question then becomes: how does VR reach those families, minority or otherwise, who may need assistance other than financial aid for postsecondary schooling? One response to that question reemphasizes the importance of the early intervention by VR in the high school careers of all deaf students and in the development of the IWRP — in conjunction with the IEP — as the student moves through the high school years. This intervention and the cooperation of educators and rehabilitation professionals is especially important for the minority and potential dropout groups discussed in this section, as Chapter 6 will point out.

VR Financial Aid for Postsecondary Education and Jobs

There is a third issue that emerges from the CADS follow-up study: the relationship of VR financial assistance for postsecondary education to employment after that schooling.

A former president of the American Deafness and Rehabilitation Association was cited earlier in this chapter regarding the main goal of vocational rehabilitation. That goal, she wrote, "is successful job placement for the individual" (Wright, 1989, p. 56). Ouellette (1983, p. 13) has indicated a similar outlook, writing that competitive employment is "the fundamental goal of the vocational rehabilitation process." It would

seem, then, that the achievement of that goal in a large number of cases should be one measure of VR's success with its deaf clients. Did the VR service reported by the largest number of respondents in the CADS follow-up survey — financial assistance for post-secondary schooling — result in "successful job placement"?

Because many of the respondents to the follow-up survey were still in a postsecondary program at the time of the survey, it is not possible to answer that question with certitude. However, one possible indication of how often VR financial aid for school resulted in jobs may be gained by analyzing the employment of those individuals who received financial assistance for school but were no longer in a postsecondary program at the time of the follow-up survey. If these individuals reported a positive employment experience, then VR financial assistance for postsecondary education could be considered successful.

Of the 72 deaf youth in this category in 1991, 61% reported they were employed — with a median income of $6.75 per hour. In comparison, of the 43 individuals who did not enter a postsecondary program after high school and did not receive any kind of service from VR, only 35% were employed at the time of the 1991 follow-up survey. Their median salary was $5.75 per hour. At least in terms of these two groups, the VR financial aid for school appears to have produced positive job outcomes.

Admittedly, this comparison of the two groups is based on a limited number of respondents. Also the comparison may be affected by variables not included on the survey questionnaire — for example, whether those assisted financially by VR had graduated from their postsecondary programs or had dropped out. However, in spite of these limitations the comparison seems to provide some support for the conclusion that VR financial aid for school does frequently lead to employment. Whether one considers the difference in the median salary of the two groups significant — $6.75 per hour versus $5.75 — is another matter.

The issue concerning the relationship of VR financial assistance for postsecondary education to employment cannot be given an unqualified answer on the basis of the CADS 1991 follow-up transition survey. The question would seem to be a critical one, both in terms of the public money spent on this financial aid service by VR and in terms of the lives of young deaf adults requesting services from VR. There is a difference between the provision of financial aid for postsecondary education by VR and the placement of a young deaf adult in stable and remunerative employment. The first involves a decision based on interviews, testing, and collection of information from a variety of sources; the second, in addition to these tasks, is a more arduous duty, involving, in various degrees, employer contacts and education, job development, job training, employment follow-up, often frequent monitoring of the work environment. Both VR services — financial assistance for school and job placement — require much time and effort on the part of the VR counselor. Job placement, however, involves a demanding and constant pressure on the counselor not encountered in the same way as the more straightforward service of providing financial assistance for education. (This time-consuming process of job training and job placement on the part of VR may account for such frequent write-in comments from the survey respondents in their complaints about VR: "waiting," "long waits," "slow process.")

## Summary and Recommendations

In the CADS book detailing the results of the original transition study (Allen, Rawlings, & Schildroth, 1989), the distinction between the "ideal" and the "reality" of the transition experience of young deaf adults was emphasized. On the one hand, there is the ideal envisaged in federal laws and regulations and aspired to both by deaf clients and by VR: stable and gainful employment, accomplished by the collaboration of the school, VR, and the deaf individual through rehabilitation planning. This planning is especially crucial for those most in need of transition services, including some minority groups, the multihandicapped, high school dropouts, and the economically distressed.

On the other hand, the complex reality frequently encountered by VR and the deaf client includes: shrinking federal, state, and local funds, overcrowded caseloads, unfamiliarity of counselors with deaf persons, their language, and their culture, problems identifying and hiring qualified interpreters, client preference regarding services, order of selection (i.e., which clients and services receive priority), finding jobs, developing job sites. Personal characteristics of the deaf client and the counselor can exacerbate these difficulties. These and other pressures of the transition experience interact, and their interactions make successful achievement of the ideal very tenuous and difficult.

How, then, can the ideal be reconciled with this complex reality? The reconciliation will, of course, never be fully accomplished; and what is accomplished will not meet the expectations of all the individuals involved. However, the consistent implementation of measures discussed earlier in this chapter increases the chances that successful rehabilitation will occur, that is, when there is

- early intervention by VR during high school;
- development of the Individualized Written Rehabilitation Program within IEP planning — especially in the local schools where the earlier CADS transition study found it not well implemented; and
- development of a written agreement between the school or school system and VR regarding the provision of VR services (cf. Allen, Rawlings, & Schildroth, 1989).

Unfortunately, these measures already have a long history, one replete with enthusiastic plans for collaboration between special education and VR — for example, the 1967 National Conference for Coordinating Rehabilitation and Education Services for the Deaf in Las Cruces, New Mexico — only to be followed by a failure to achieve those goals (see Tooman, 1986). One modest step toward reversing these failures and toward a more successful transition of deaf youth into their postsecondary careers would be the consistent implementation of the three measures listed in the previous paragraph: early high school intervention by VR, completion of the IWRP before age 16 (as envisaged in new federal regulations), and a written agreement between VR and special education programs outlining in specific terms how they will cooperate toward the successful transition of deaf students.

Notes

[1]The term "dropout" has a variety of meanings, often depending on individual state or researcher definitions or the definition used by the Bureau of the Census. As Rumberger (1987) has pointed out, these varying definitions can result in widely discrepant statistics of the dropout rate. In the Annual Survey data cited in this chapter, "dropout" means an individual reported by the school or school district to be no longer enrolled, but without having graduated or transferred to another school, either in the same system or another one. (This, of course, leaves untouched the question of students returning to high school after dropping out or of those receiving a high school equivalency certificate.) For a more complete discussion of the CADS transition study dropout data and its relationship to Bureau of the Census statistics, see Allen, Rawlings, and Schildroth (1989, pp. 77-81).

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***References***

Allen, T.E. (1986). *Understanding the scores: Hearing-impaired students and the Stanford Achievement Test (7th Edition).* Washington, DC: Gallaudet University, Gallaudet Research Institute.

Allen, T., Schildroth, A., & Rawlings, B. (1990). A longitudinal study of deaf students in transition from school to work: A summary of the findings of the data collected in the first year. In G. Anderson & D. Watson (Eds.), *Habilitation and rehabilitation of hearing-impaired adolescents in the mainstream* (pp. 159-167). Little Rock, AR: University of Arkansas, Rehabilitation and Research and Training Center on Deafness and Hearing Impairment.

Allen, T., Rawlings, B., & Schildroth, A. (1989). *Deaf students and the school-to-work transition.* Baltimore, MD: Paul H. Brookes Publishing Co.

Armstrong, D., & Schneidmiller, K. (1983). *Hearing impaired students enrolled in U.S. higher education institutions: Current status of enrollments and services* (Institutional Studies Report 83-3). Washington, DC: Gallaudet College.

*Federal Register.* (1992, September 29). Part II, Assistance to states for the education of children with disabilities programs and preschool grants for children with disabilities; Final rule. Vol. 57, No. 189, 44814-44815.

Granovetter, M. (1983). The strength of weak ties: A network theory revisited. In R. Collins (Ed.), *Sociological theory*, (pp. 201-233). San Francisco, CA: Jossey-Bass.

Holt, J. (1993). Stanford Achievement Test — 8th Edition: Reading comprehension subgroup results. *American Annals of the Deaf, 138*, 172-175.

Johnson, D., Bruininks, R., & Thurlow, M. (1987). Meeting the challenge of transition service planning through improved interagency cooperation. *Exceptional Children, 53*, 522-530.

Joyce, E., & Mathay, G. (1986). A study of closed cases: Implications for the administration of deafness rehabilitation services. *Journal of Rehabilitation of the Deaf, 20*(1), 5-13.

Kerstetter, P. (1985). *Demographic predictors of postsecondary program choice of hearing impaired secondary school students*. Unpublished doctoral dissertation, Gallaudet College, Washington, DC.

National Center for Education Statistics. (1990). *The condition of education*. (Volume 1: Elementary and Secondary Education.) Washington, DC: U.S. Government Printing Office.

Ouellette, S. (1983). An analysis of employment search, development, and placement strategies currently employed with hearing impaired persons in the United States. *Journal of Rehabilitation of the Deaf, 17*(3), 13-20.

Rawlings, B., Schildroth, A., & Allen, T. (1989, June). "Deaf students and the school-to-work transition." Presentation at a meeting of the Convention of American Instructors of the Deaf and Conference of Educational Administrators Serving the Deaf (CAID/CEASD), San Diego, CA.

Rumberger, R. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research, 57*, 101-121.

Schildroth, A., Allen, T., & Rawlings, B. (1989, May). "A follow-up study of deaf students in transition." Presentation at a meeting of the American Deafness and Research Association (ADARA), New York, NY.

Schildroth, A., Rawlings, B., & Allen, T. (1991). Deaf students in transition: Education and employment issues for deaf adolescents. *The Volta Review, 93*, 41-53.

Schildroth, A., & Hotto, S. (1993). Annual Survey of Hearing-Impaired Children and Youth: 1991-92 School Year. *American Annals of the Deaf, 138*, 163-171.

Tooman, M.L. (1986). An historical background of transitional employment programs and a perspective on the future. In L.G. Perlman & G.F. Austin (Eds.), *The transition to work and independence for youth with disabilities* (pp. 9-17). Alexandria, VA: National Rehabilitation Association.

U.S. Bureau of the Census. (1990). *Statistical abstract of the United States: 1990*. Washington, DC: U.S. Government Printing Office.

U.S. Bureau of the Census. (1991). *Population profile of the United States: 1991*. Washington, DC: U.S. Government Printing Office. (Current Population Reports, Series P-23, No. 173).

U.S. Bureau of the Census. (1992). *What's it worth? Educational background and economic status: Spring 1990*. Washington, DC: U.S. Government Printing Office. (Current Population Reports, Series P70-32.)

U.S. Bureau of the Census. (1993). *Poverty in the United States: 1992*. Washington, DC: U.S. Government Printing Office. (Current Population Reports, Series P60-185).

White, C., Karchmer, M., Armstrong, D., & Bezozo, C. (1983). Current trends in high school graduation and college enrollment of hearing impaired students attending residential schools. *American Annals of the Deaf, 128*, 125-131.

Will, M. (1985, Spring). OSERS programming for the transition of youth with disabilities: Bridges from school to working life. *Rehabilitation/WORLD*, *9*(1), 4-7, 42-43.

Wright, G. (1989). Parent and rehabilitation partnerships. In T. Allen, B. Rawlings, & A. Schildroth, *Deaf students and the school-to-work transition* (pp. 53-58). Baltimore, MD: Paul H. Brookes Publishing Co.

# *Relationships between Academic Performance on an Achievement Test and Later Postsecondary Outcomes*

Debra E. Rose

Abstract

*The relationship between scores of deaf students on the Stanford Achievement Test (Seventh Edition) and their postsecondary experiences was investigated. Data from two data bases were analyzed: a data base from a 1983 Stanford Achievement Test (SAT) norming project for deaf students and a data base pertaining to a series of studies that examined the school-to-work transition of deaf high school students. Scores from the SAT Reading Comprehension and Mathematics Computation subtests were analyzed, and the top and bottom quartiles were crosstabulated with selected variables from the transition data base. Results indicated that students scoring high on the SAT Reading Comprehension and Mathematics Computation subtests were more likely to be placed in academic tracks in high school, more likely to receive formal education after high school, more likely to be satisfied with vocational rehabilitation services, and less likely to have additional educationally significant disabilities. In contrast, students who scored in the bottom SAT quartile were more likely to be enrolled in vocational tracks in high school, less likely to receive formal education after high school, less likely to be satisfied with vocational rehabilitation services, and more likely to have additional educationally significant disabilities.*

In 1983 the Center for Assessment and Demographic Studies (CADS), part of the Gallaudet Research Institute at Gallaudet University in Washington, D.C., conducted a special project to develop norms for deaf students on the Stanford Achievement Test (SAT), Seventh Edition (Allen, 1986). The data base for the norming project was comprised of a stratified random sample of deaf and hard-of-hearing students throughout the U.S. As a result of the norming project CADS was able to provide various test scores, including percentile ranks. Percentile ranks are commonly based on age comparisons, in this case for deaf and hard-of-hearing students, and as such provide valuable information regarding a student's functioning in relation to his or her peers. While other kinds of scores may be derived from the SAT raw score, only the percentile scores will be discussed here.

From 1986 to 1991 CADS also conducted a series of studies investigating the school-to-work transition of deaf high school students. The survey information was initially collected from students who were known to have a severe or profound hearing loss and were between the ages of 16 and 22 years. Most of the students were in high school; some had either graduated or had dropped out of school. A follow-up survey was conducted one year later, and a second follow-up survey was conducted four years after

the initial survey. The surveys yielded information on the availability and nature of employment after high school, plans for formal education after high school, salary, relationship with supervisors, and so forth. The reader may wish to review a full description of the transition project provided earlier in the introduction to this monograph.

The purpose of the present study was to investigate the relationship of the SAT scores and students' postsecondary experiences, utilizing both the 1983 norming information and the 1986-1991 transition information. The SAT as a measurement of academic achievement was selected for the study for two reasons. First, strong evidence exists for the content validity of the SAT. When studying the relationship between the test's objectives and the high school curricula in which hearing-impaired students were enrolled, Harnisch and Allen (cited in Allen, 1986) found that, in general, the content areas assessed by the Stanford Mathematics Computation and Reading Comprehension subtests were covered adequately. Secondly, evidence for criterion-related validity was reported by Allen (1986); the SAT was able to predict success at college in terms of grade point average and attrition after one semester at Gallaudet University.

Academic achievement scores (SAT scores) were predicted to correlate significantly with some transition variables (i.e., outcomes occurring in and out of high school). In particular, students whose percentile ranks were high on the SAT in 1983 were predicted to have different academic experiences and training both in and after high school than low-scoring students; high-scoring students were predicted to take a more academic route, while low-scoring students were predicted to take a more vocational training route. Some demographic variables (e.g., additional educationally significant disabilities) were also analyzed to investigate their relationship with academic performance.

## Methodology

The transition data base and the SAT norming data base were linked together in the present longitudinal study to identify all students who participated in the 1983 Stanford norming and also participated in all of the transition study phases. The linkage identified 139 severely and profoundly deaf subjects. The ages of these students at the time of testing ranged from 13 to 17 years. The ages of the students as of December 31, 1991, after completing the final transition survey form, ranged from 22 to 26 years.

Although the SAT consists of many different subtests, only scores from the Reading Comprehension and Mathematics Computation subtests were analyzed. To differentiate the top and lower performers, final analyses were based on the top and bottom quartiles of students: those students whose percentile ranks were 76 or above were designated as the top quartile; students whose percentiles were below 25 were designated as the bottom quartile. The final sample was thus reduced to 27 students in the bottom quartile and 34 students in the top quartile for the Reading Comprehension subtest. For Mathematics Computation, the top quartile contained 49 students and the bottom quartile included 26 students.

## Results

To analyze differences between academic performance and later outcomes or experiences, the top and bottom quartiles from the 1983 SAT norming data were crosstabulated with selected demographic and outcome variables from the 1986-1991 transition data. For both SAT subtests, chi-square analyses revealed significant differences between the top and bottom quartiles for the following variables ($p < .05$): types of tracking program in which student was enrolled in high school; enrollment in formal education after high school; satisfaction with vocational rehabilitation services; and additional disabilities. However, within the Reading Comprehension subtest of the SAT, students in the top quartile were found to enroll in significantly different types of programs after high school than the bottom quartile, and, if they worked, appeared to hold different types of jobs after high school as well ($p < .05$). The differences for these variables within the Mathematics Computation subtest were not found to be significant. Table 1 shows the values of the chi-square analyses for the significant variables.

*Table 1. Results of Significant Chi-square Analyses*

| *Variable* | *Reading Comprehension* | | | *Mathematics Computation* | | |
|---|---|---|---|---|---|---|
| | *df* | *N* | $X^2$ | *df* | *N* | $X^2$ |
| Types of tracking programs in which student was enrolled in high school | 2 | 30 | 18.9 | 2 | 36 | 13.7 |
| Enrollment in formal education after high school | 1 | 61 | 15.8 | 1 | 75 | 17.1 |
| Satisfaction with vocational rehabilitation services | 1 | 40 | 9.3 | 1 | 42 | 3.9 |
| Additional disabilities | 1 | 61 | 21.9 | 1 | 75 | 28.3 |
| Types of formal educational programs after high school | 3 | 37 | 23.4 | | | |
| Types of jobs after high school | 7 | 30 | 22.8 | | | |

### Tracking

Figure 1 illustrates the relationship of SAT Reading Comprehension scores to differences in tracking programs in high school. The tracking program information was obtained from the survey distributed to guidance counselors in the initial phase of the transition study. The guidance counselor was asked to indicate the track in which the

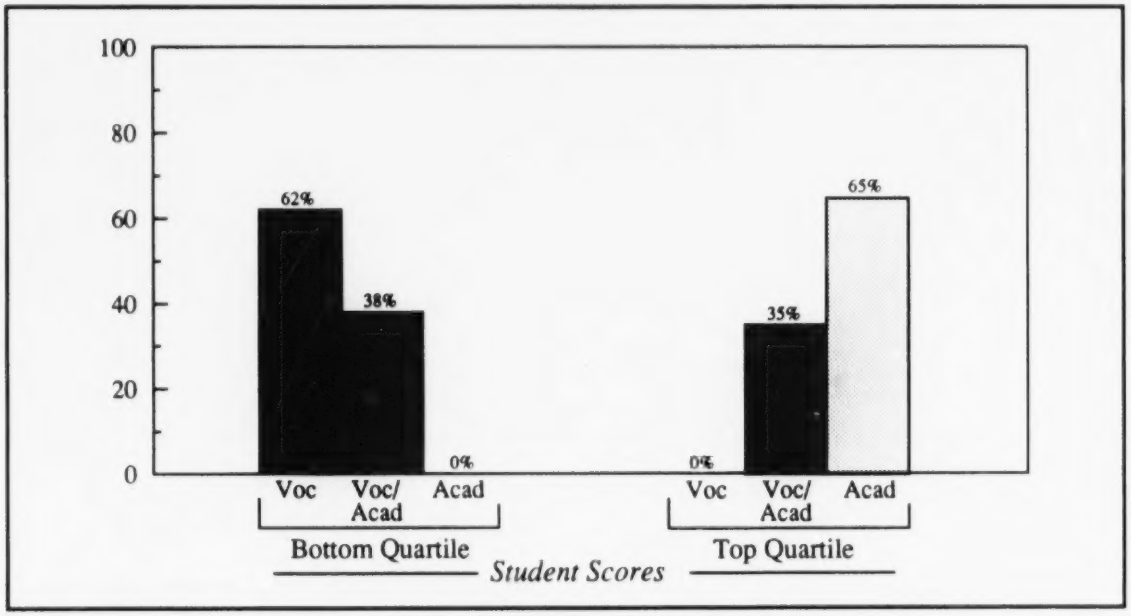


*Figure 1.* Relationship of Stanford Achievement Test, 7th Edition, Reading Comprehension scores to different tracking programs in high school.

student was enrolled: (1) vocational, (2) academic, or (3) an equal mix of vocational and academic. A student was defined as being enrolled in a vocational track if most of his or her classes were vocational in nature. Students in academic tracks were enrolled in mostly academic classes. The third category, "both vocational and academic," indicated students were enrolled in an equal mixture of vocational and academic classes in high school. A large percentage of students (62%) scoring in the bottom quartile of the SAT Reading Comprehension subtest in 1983 were enrolled in a vocational track; 38% were enrolled in both vocational and academic tracks. None of the students scoring in the bottom quartile was enrolled in a high school academic track. The opposite pattern occurs for the top quartile. None of these top scoring students was enrolled in a vocational track. The number of students enrolled in both vocational and academic tracks was comparable to that of the bottom quartile (35% top quartile; 38% bottom quartile). Contrary to the bottom quartile of students, 65% of students scoring in the top quartile of the Reading Comprehension subtest of the SAT were enrolled in academic tracks.

For the Mathematics Computation subtest, 46% of the students who scored within the bottom quartile in 1983 were enrolled in vocational tracks in high school; 39% were enrolled in both vocational and academic tracks (Figure 2). While none of the bottom quartilers in Reading Comprehension was enrolled in academic tracks, 15% of the students in the Mathematics Computation bottom quartile were enrolled in academic classes. For the top quartile in Mathematics Computation, only 4% of the students were enrolled in vocational tracks; 22% were enrolled in both vocational and academic classes. Nearly three fourths (74%) of those in the top quartile were enrolled in academic classes in high school.

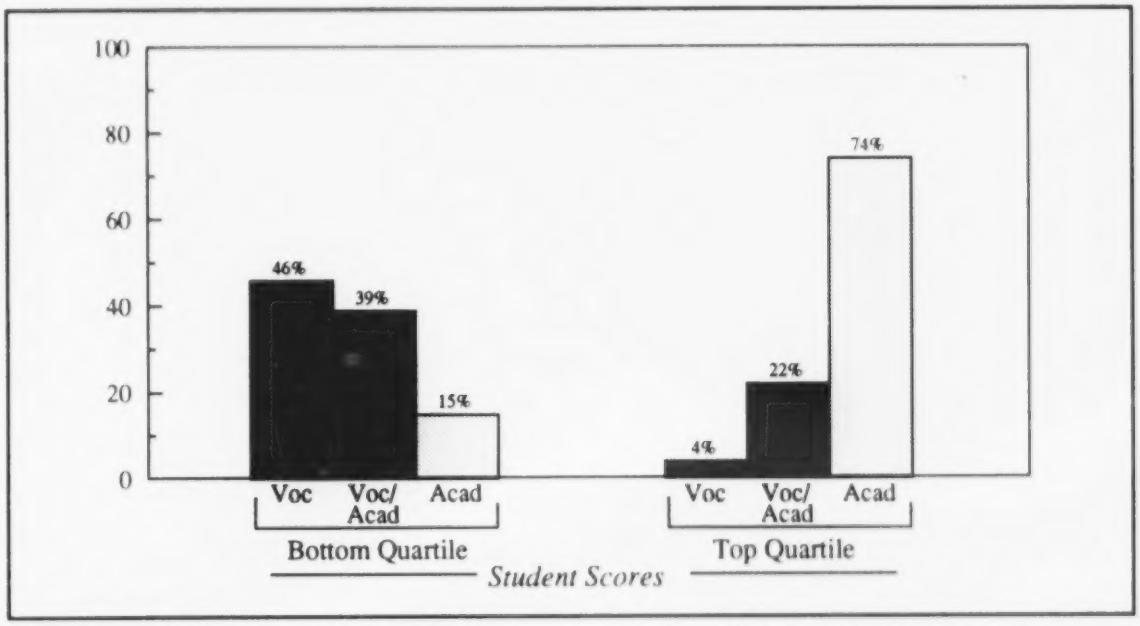


*Figure 2.* Relationship of Stanford Achievement Test, 7th Edition, Mathematics Computation scores to different tracking programs in high school.

Postsecondary Education

In the 1991 follow-up survey, students were asked if they received any formal education after leaving high school. For the students scoring in the bottom quartile in Reading Comprehension on the SAT in 1983, less than one half (44%) received formal education after high school (Figure 3). However, most of the students (91%) in the top quartile in Reading Comprehension went on to receive formal education after high school.

In terms of the bottom quartile of students who took the Mathematics Computation subtest, 46% had enrolled in formal education after high school; 54% did not. The distribution for those in the top quartile on the Mathematics Computation subtest was comparable to the top scorers on the Reading Comprehension subtest: 90% enrolled in formal education after high school; only 10% did not (Figure 4).

Type of Postsecondary Program

Students were also asked to indicate the type of program in which they enrolled after high school. The choices provided were: vocational/technical program; community college; college or university; and "other" school (where the program did not fit the previous three categories). Results for this analysis were significant only for the Reading Comprehension subtest variable and are presented in Figure 5. For the bottom quartile in Reading Comprehension on the SAT in 1983, results were as follows: 46% attended a vocational/technical program after high school; 36% attended community college; none attended college or university; and 18% attended "other" schools. For students scoring in

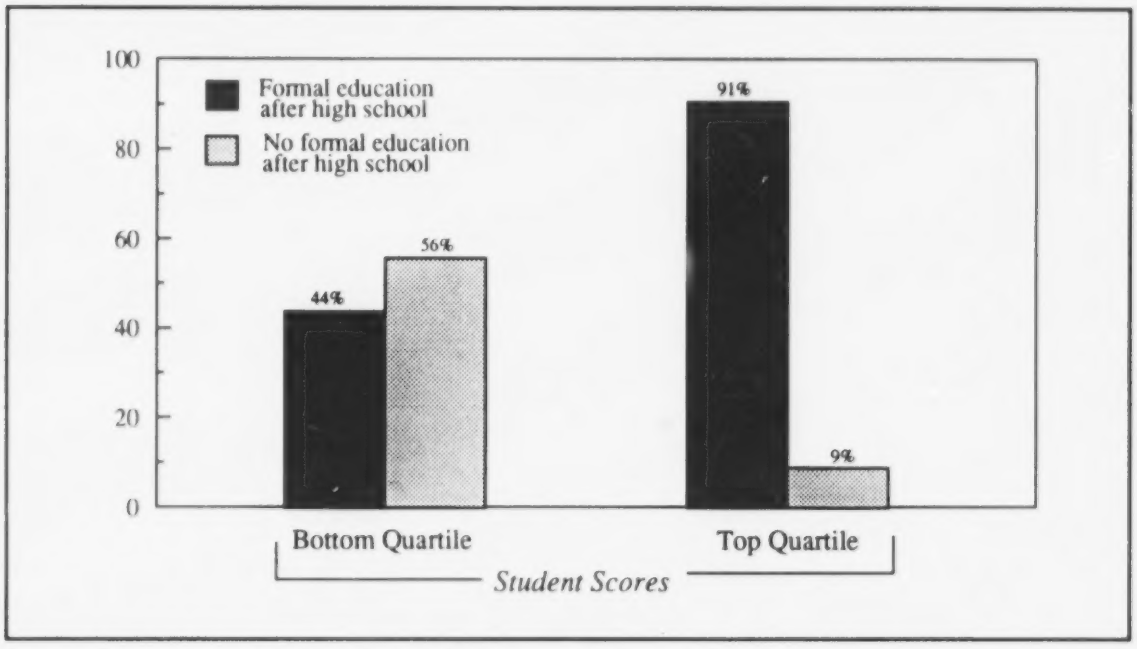


*Figure 3.* Relationship of Stanford Achievement Test, 7th Edition, Reading Comprehension scores to enrollment in formal education after high school.

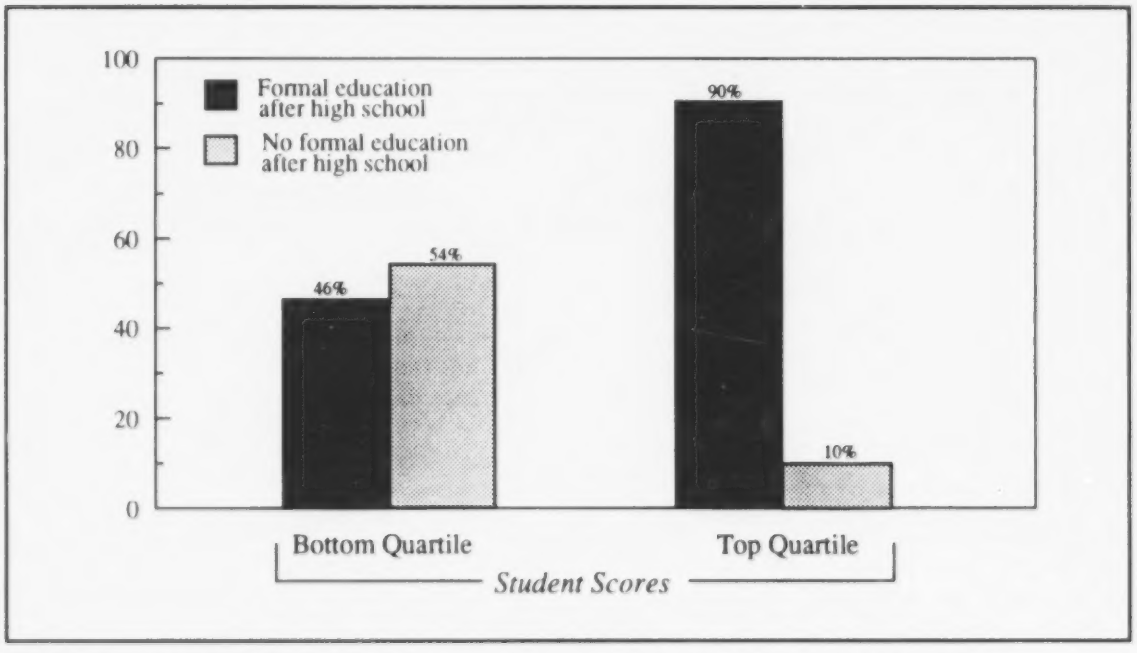


*Figure 4.* Relationship of Stanford Achievement Test, 7th Edition, Mathematics Computation scores to enrollment in formal education after high school.

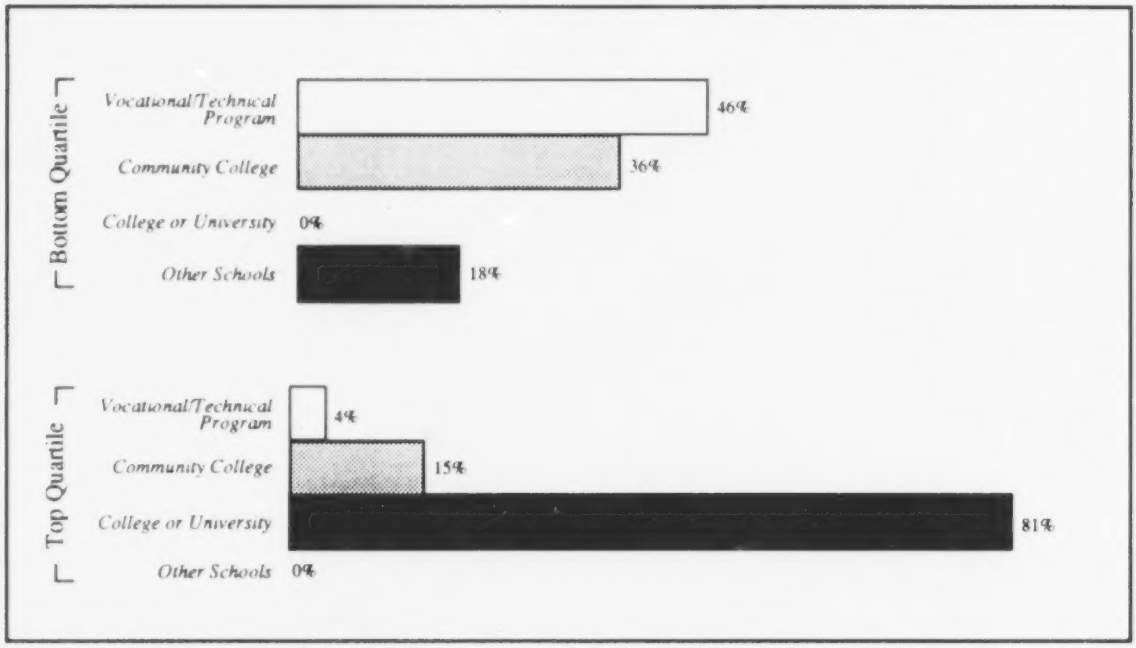


*Figure 5.* Relationship of Stanford Achievement Test, 7th Edition, Reading Comprehension scores to enrollment in different types of formal education programs after high school.

the top quartile of the SAT Reading Comprehension subtest, only 4% attended vocational/technical programs and 15% attended community college. In comparison to the bottom quartile, where none of the students attended college or university, most of those in the top quartile (81%) attended such institutions. None of the students in the top quartile in Reading Comprehension attended "other" schools.

Type of Employment

Figure 6 shows that a large majority (73%) of students who worked after high school and scored in the bottom quartile on the SAT Reading Comprehension subtest worked in a service capacity; the rest were employed as either precision production workers (9%) or operators and laborers (18%). The picture differs for the top quartile students; the types of their employment after high school were more variable. The largest percentage (26%) of students scoring in the top quartile in Reading Comprehension in 1983 was employed in an administrative support capacity. Technical and sales workers were the next most frequently reported (21%). Nearly 16% worked in professional fields, while managerial, precision production, and operator and laborer positions were each reported by 11% of the top performing students. Again, results were not significant for the Mathematics Computation subtest variable. It should also be noted that, since many of the crosstabulation cells in this particular analysis contained less than five subjects, caution must be used in interpreting the results.

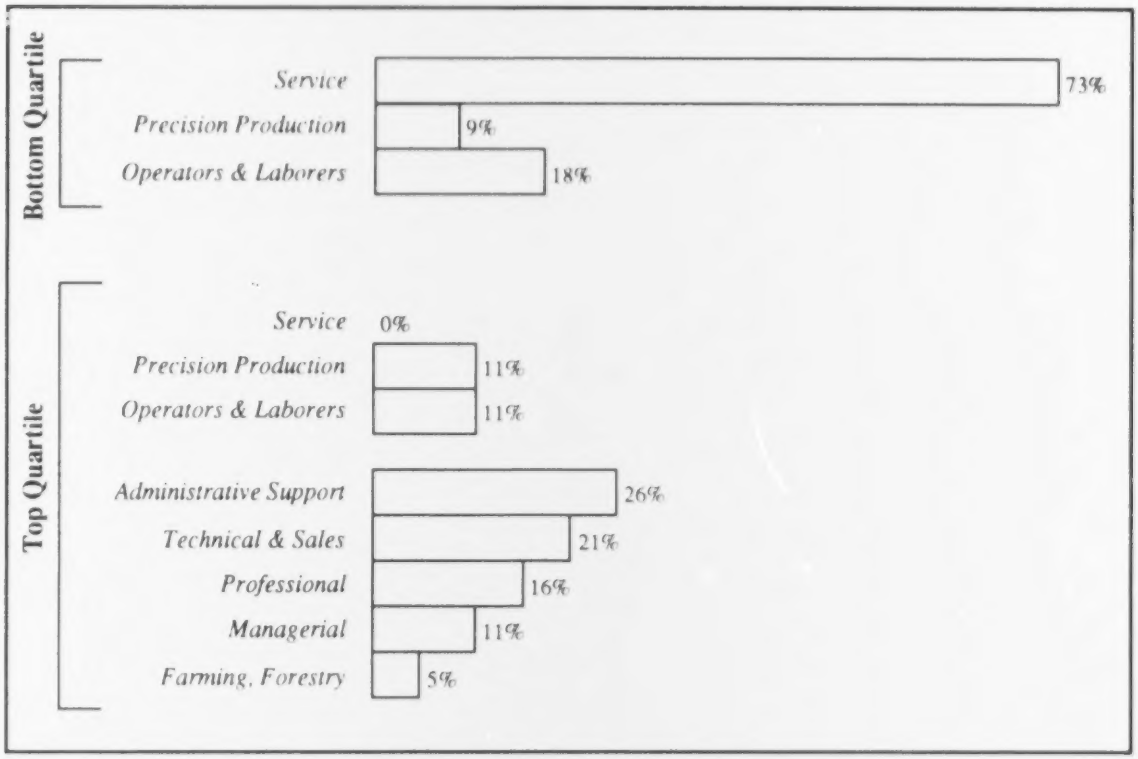


*Figure 6.* Relationship of Stanford Achievement Test, 7th Edition, Reading Comprehension scores to occupation in 1991.

Satisfaction with Vocational Rehabilitation Services

Many deaf students receive vocational rehabilitation services, either to assist them with improving job skills in order to find jobs or with further education after high school. In the 1991 follow-up survey of the transition project, subjects were asked if they were satisfied with vocational rehabilitation services. As indicated by Figure 7, only 27% of the students who took the Reading Comprehension subtest of the 1983 SAT norming project and scored in the bottom quartile were satisfied with these services; most (73%) were not satisfied. The opposite is found for the high achievers; among the top quartile of students, 76% were satisfied with vocational rehabilitation services and 24% were not satisfied. This pattern is understandable. Higher achieving individuals tend to enter postsecondary educational programs after high school and are more likely to receive vocational rehabilitation services in the form of money from state offices of vocational rehabilitation for this education. Since they receive services, they are more likely to be satisfied.

On the other hand, lower performing individuals (i.e., those scoring in the bottom quartile of the SAT) are less likely to go on to formal education, and so are less likely to receive vocational rehabilitation services in the form of money for formal education; if they do not receive money, they may be less likely to be satisfied. In addition, jobs are

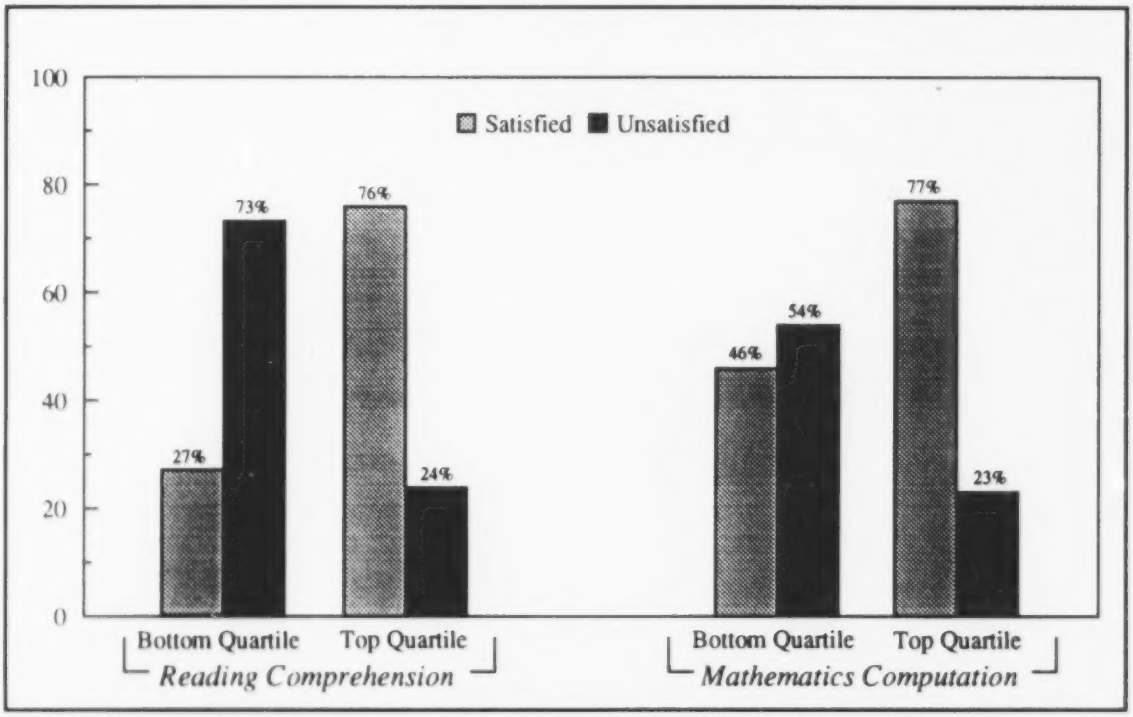


*Figure 7.* Relationship of Stanford Achievement Test, 7th Edition, Reading Comprehension and Mathematics Computation scores to satisfaction with Vocational Rehabilitation services.

often difficult to find, especially for low achievers. Since vocational rehabilitation agencies may not have been able to help these students find jobs — discussed more at length in the chapter following — they are less likely to be satisfied with the services.

For the Mathematics Computation subtest, the relationship between the quartiles is slightly different (see Figure 7). Within the bottom quartile of students, 46% were satisfied with vocational rehabilitation services; 54% were not. A larger difference exists for the top quartile: most (77%) were satisfied; a relatively small percentage (23%) was not.

Additional Educationally Significant Disabilities

Figure 8 depicts the relationship of scores to additional disabilities. The information was obtained from CADS' Annual Survey data base in which school staff were asked the question, "Does the student have any educationally significant disabilities in addition to deafness?" Educationally significant disabilities were defined by the presence of conditions other than deafness which may affect learning. Within the SAT Reading Comprehension subtest, the majority of those scoring in the bottom quartile, 74%, were reported to have educationally significant disabilities in addition to their deafness. The opposite is true for the students in the top quartile for Reading Comprehension. Only

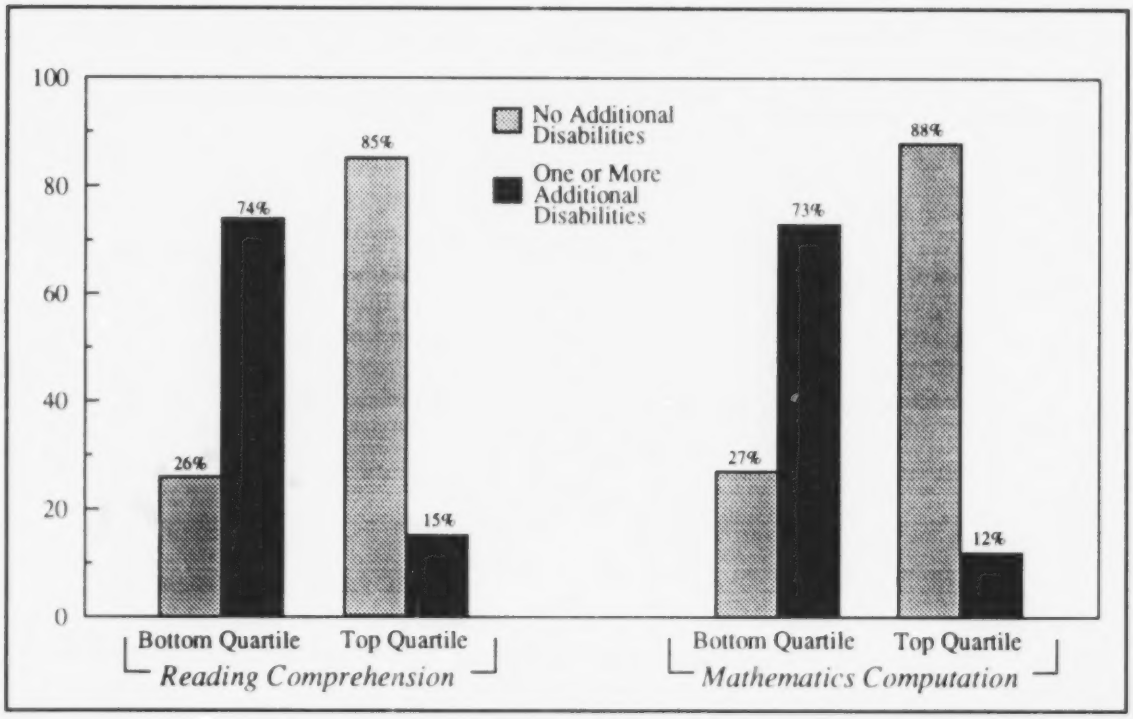


*Figure 8.* Relationship of Stanford Achievement Test, 7th Edition, Reading Comprehension and Mathematics Computation scores to additional disabilities.

15% had an additional disability; a large majority (85%) had none. The same results appeared for the Mathematics Computation subtest. In the bottom quartile, 73% had additional disabilities; 27% did not. For the top quartilers, 88% did not have additional disabilities; only 12% did. The large proportion of students with additional disabilities scoring in the bottom quartile is almost certainly due to the fact that these additional conditions hindered their SAT performance, resulting in a low score on the test.

## Discussion

Results of this study reveal that students scoring high in Reading Comprehension or Mathematics Computation on the Stanford Achievement Test in 1983 were more likely to be placed in academic tracks in high school, more likely to receive formal education after high school, specifically at a college or university, more likely to be satisfied with vocational rehabilitation services, and less likely to have additional educationally significant disabilities. In contrast, students who scored low on the SAT were more likely to be enrolled in vocational tracks in high school, less likely to receive a formal educational degree at a college or university, more likely to work in a service capacity, less likely to be satisfied with vocational rehabilitation services, and more likely to have educationally significant additional disabilities.

High school is considered by many as a training ground to either prepare students for more advanced education or to prepare students for the work force at an entry level. Indeed, supporters for a New York State Board of Regents proposal for high school students to work as a requirement for graduation contend that "schools should prepare students for life" (Jordan, 1993). Traditionally, many schools attempted to do this by tracking students into specific preparatory programs, either academic or vocational in nature. In examining tracking effectiveness from the National Education Longitudinal Study of 1988, Braddock and Slavin (1992) indicate that ability grouping actually worsens the situation of low-achieving students. Low-achieving 8th graders placed in lower ability tracks were "more likely to end up in non-college preparatory programs in the 10th grade than were low achievers who had not been tracked" (cited in Schmidt, 1992, p. 9). The researchers concluded that being tracked in a low-ability grouping greatly reduces the chances of taking college preparatory classes. The picture was different, however, for the high-achieving students in the national study; their academic prospects did not seem to improve with ability grouping.

The present study is consistent with findings from the National Education Longitudinal Study; deaf students who scored in the bottom quartile were more likely to be placed in vocational tracks in high school, reducing the likelihood that they would receive formal postsecondary education or attain professional status. Furthermore, these low achievers were more likely to work in service-related capacities if and when they entered the work force after high school.

Some school systems have begun to approach the dilemma of expanding opportunities for high-achieving students while opening more positive opportunities for low-achieving students. (Many of these experiments have not been formally studied and are not written up in the research literature.) For example, the Southern Regional Education Board has organized a pioneer program to combine academic and vocational skills (Harp, 1993). The program was designed to challenge students of all abilities, where emphasis is placed on thinking skills, problem-solving, and teamwork so that students become competent in both the classroom and a potential workplace environment.

In New York state, the movement to directly involve high schools in worker training is growing, as indicated by the recent Board of Regents proposal mentioned above (Jordan, 1993). In Maine, the Youth Apprenticeship Program was pioneered to expand job-training programs and to give more attention to students not planning to attend college (Lively, 1993).

The above examples lend support for the notion that the transition from high school to work can be problematic, and services and resources must be available in order for students to make a successful transition. However, these examples only refer to work-related events occurring after high school. They do not address what happens to students who go on to college, and if they finish college, what happens afterwards. The present study found a high percentage of top-achieving students receiving formal education after high school. However, once in college, students may lack resources to prepare them for jobs after college. In a study by Schriner, Roessler and Raymer (1991), students at Gallaudet University were found to be concerned about the availability and range of career planning and placement services. Further research is necessary to assess the

adequacy of services which purport to assist in students' career training. Another topic for investigation is that of students' transitional experiences by utilizing different variables than were used in the present study, such as: mode of communication used to teach deaf students; the effects of mainstreaming; parents' socioeconomic status; the influence of education or training in the home; the nature or number of additional educationally significant disabilities. Still another direction for research may be to investigate the relationship between academic achievement and later outcomes utilizing a different measurement of achievement (e.g., grade point average). Finally, further research needs to address how low-scoring students can come to experience better transition outcomes than they currently do.

### *References*

Allen, T. E. (1986). *Understanding the scores: Hearing-impaired students and the Stanford Achievement Test (7th Edition).* Washington, DC: Gallaudet Research Institute, Center for Assessment and Demographic Studies.

Braddock, J. H., & Slavin, R. E. (1992, September). *Why ability grouping must end: Achieving excellence and equity in American education.* Paper presented at the Common Destiny Conference at Johns Hopkins University, Baltimore, MD.

Harp, L. (1993, June 23). S.R.E.B. project helps schools blur line between vocational and academic tracks. *Education Week*, pp. 8-9.

Jordan, M. (1993, March 27). New York agrees to six pilot projects putting high school students to work. *Washington Post*, p. A3.

Lively, K. (1993, March 31). Maine's month-old youth apprenticeships show how a national plan might work. *The Chronicle of Higher Education*, pp. 20-21.

Schmidt, P. (1992, September 16). Tracking found to hurt prospects of low achievers. *Education Week*, p. 9.

Schriner, K. F., Roessler, R. T., & Raymer, J. M. (1991). Employment concerns for deaf university students. *Journal of the American Deafness and Rehabilitation Association*, 25(2), 13-19.

# *School and Demographic Predictors of Transition Success: A Longitudinal Assessment*

Thomas E. Allen

Abstract

*This chapter employs data from both the Center for Assessment and Demographic Studies' 1986 surveys of students and their counselors and the 1991 follow-up survey to develop a model of successful school-to-work transitions for deaf students that incorporates both demographic and training variables. Students were dichotomized into "successful" and "unsuccessful" groups based upon their reported experiences from the 1991 survey. A wide range of variables was selected as predictors from the earlier surveys. Logistic regression was employed to develop a successful transition model. After a series of analyses, a final model is presented that includes four highly significant predictors: sex, minority status, relative mix of academic and vocational coursework, and integration with hearing students during instruction. Variables associated with high school contact with vocational rehabilitation were not significant in the final model. The model equation is used to calculate the odds of a successful transition for different demographic subgroups in different educational settings.*

In the report of data collected in the first year of the transition study conducted by the Center for Assessment and Demographic Studies (CADS), Allen, Rawlings, & Schildroth (1989) demonstrated that there is considerable variation in services provided by high schools to deaf students aimed at facilitating their transition from school to work. Furthermore, transition experiences such as possessing a formal Individualized Written Rehabilitation Plan (IWRP), receiving vocationally oriented training, participating in vocational courses likely to lead to high paying jobs, and having a part-time job in school varied systematically as a function of certain demographic characteristics. Specifically, males and females differed significantly in part-time employment and in the content of their vocational coursework. White, black, and Hispanic students differed significantly in the degree to which they were enrolled in predominantly vocational versus academic courses, in the content of their vocational coursework, and in the mean hourly wages earned by those students having part-time or summer work. Students with additional disabilities were less likely to be enrolled in vocational courses that would lead to higher paying jobs than those without additional disabilities.

Given these results, it was possible to make predictions about the likelihood of transition success for students with varying characteristics: minority deaf students, female deaf students, and deaf students with additional disabilities were considered to be at a greater disadvantage in their prospects for a successful transition from school to work. This consideration was based on an assessment of the educational experiences of deaf students with different characteristics while they were still in school.

A goal of the longitudinal follow-up study reported here was to examine the actual transition successes and failures for deaf students from the original sample and to assess directly the impact of the noted differences in demographic and training characteristics of these students on their transition success rates after they left high school. The purpose of the current chapter is to present this analysis. A model will then be developed and tested that examines the effects of demographic and training characteristics on the eventual transition success of deaf students after high school.

## Method

### Data sources

Variables analyzed in the current paper came from merged data sets of the 1985-86 Annual Survey of Hearing Impaired Children and Youth, the 1987 student and counselor school-to-work transition surveys, and the 1991 second student follow-up survey. A fuller description of the methodology used for these surveys is described in Allen, Rawlings, and Schildroth (1989) and in the introduction to this monograph.

### Description of variables

Transition success. For the purpose of this analysis, all transition outcomes were dichotomized into "Successful" and "Unsuccessful" categories. Those students who, at the time of the follow-up study in the spring of 1991, were working 30 or more hours per week or who were attending postsecondary educational programs were classified as "Successful," and those who were working less than 30 hours a week and not receiving any formal postsecondary training at the time of the study were classified as "Unsuccessful."

Admittedly, this dichotomization simplifies transition outcomes. Students who were working full-time, but in jobs that were beneath their abilities were considered "successful" here, perhaps inappropriately. Additionally, individuals who chose not to work full-time or attend school — homemakers, for example — were considered "unsuccessful," perhaps inappropriately. Nonetheless, it was felt that this definition would correctly classify a large number of the respondents into successful and unsuccessful categories. From the point of view of vocational rehabilitation, attending postsecondary education programs or working full-time is considered a successful outcome. Additionally, dichotomizing the dependent variable allows the researcher to employ logistic regression and consider transition models from which the likelihood of a successful transition, given a set of demographic and school characteristics, could be estimated. Finally, other chapters in this monograph describe transition outcomes in greater detail. For these reasons, the dichotomization is warranted.

Demographic characteristics. The following demographic characteristics were considered for inclusion in the transition model: age, sex, race/ethnic background, degree of hearing loss, presence of additional educationally significant disabilities, mother's hearing status, and father's hearing status. Operational definitions of these variables appear in Figure 1.

| | |
|---|---|
| Age: | Age of student at time of initial survey in March, 1987. |
| Sex: | Sex of student: 0, if male; 1, if female. |
| Race: | Race or ethnic background; three dummy variables were created:<br>WHITE: 1, if white, non-Hispanic, 0 otherwise.<br>BLACK: 1, if black, non-Hispanic, 0 otherwise.<br>HISP: 1, if Hispanic, 0 otherwise. |
| Hearing Loss: | 1, if severe; 2, if profound. Students with milder impairments were not included in the study. Only those students whose Better Ear Average was 71 dB or greater were surveyed. |
| Presence of additional educationally significant disabilities: | 1, if yes; 0 otherwise. |
| Mother's Hearing:<br>Father's Hearing: | 0 = Normal hearing; 1 = Deaf or Hard-of-Hearing. |

*Figure 1*: Operational definitions of demographic variables included in transition model.

Training variables. The following training variables were considered: integration status (whether students were integrated with hearing students for at least part of their academic instruction), instructional communication mode, mix of academic and vocational coursework, whether or not students had a VR counselor in high school, and whether or not students had a formalized IWRP. Operational definitions of these variables appear in Figure 2.

## Analysis

### Descriptive Statistics and Correlations of Predictors with Transition Success

The means and standard deviations for each of the variables and their correlations with transition success are presented in Table 1. In the case of dichotomous variables, the means represent proportions. For example, Table 1 reveals that 64% of the current sample experienced a successful transition outcome, using the definition described above.

Correlations of transition success with demographic variables. Age correlated negatively with transition success, demonstrating that older students still in school in 1987 were less likely to experience a successful transition in 1991. The negative correlation between sex and transition success indicates lower levels of success for females. Being white, non-Hispanic contributed to positive transition outcomes; being black or Hispanic led to poorer ones. Hearing loss was not significantly correlated with transition success in the current sample. (However, the current sample was comprised

| | |
|---|---|
| Integration Status: | Whether students received academic instruction with hearing students, either full- or part-time: 1, if yes; 0, otherwise |
| Communication Mode: | 1, auditory/oral; 2, if sign and speech or sign alone. |
| Mix of academic and vocational coursework: | Relative mix of academic and vocational coursework in high school: 1, All vocational courses; 2, Mostly vocational courses; 3, Equal mix of academic and vocational coursework; 4, Mostly academic coursework; 5, All academic coursework. |
| Whether students had a VR counselor in high school: | 1, if yes; 0, otherwise. |
| Whether students had an IWRP: | 1, if yes; 0, otherwise. |

*Figure 2*: Operational definitions of demographic variables included in transition model.

only of those students with severe and profound hearing loss; thus it should not be concluded that hearing loss, in general, is unrelated to transition success.) Having a disability in addition to deafness led to poorer transition outcomes. Parental hearing status was not correlated with outcome.

Correlations of transition success with training variables. Integration with hearing students for some academic instruction correlated positively with transition success. Instruction in sign and speech versus an auditory/oral mode of communication for instruction was negatively correlated with transition success. Higher proportions of academic versus vocational coursework led to positive outcomes. Having a VR counselor and an IWRP were not correlated with subsequent transition success.

Logistic regression. Logistic regression is a statistical technique for evaluating models in which the dependent measure is dichotomous. Like ordinary least squares regression, logistic regression produces a set of predictor coefficients that define the best fitting line to the data. Unlike ordinary least squares analysis, the equation that is generated allows for the estimation of likelihood (probability) of membership in the category defined by the "1" value in the dichotomized dependent variable — in this case, experiencing a successful transition. Also, the logistic regression analysis produces a set of odds ratios for each predictor which may be interpreted as the increased or decreased odds of outcome success, given membership in a group defined by a predictor variable, while controlling for all other predictors.

Logistic regression is ideal for the present analysis because it allows the development of an equation which will estimate the likelihood of transition success for individuals with different characteristics defined by our predictor variables. As noted

*Table 1. Means, Standard Deviations, and Correlations with Transition Success for Transition Model Variables*

| *Variable* | *Mean* | *SD* | *Valid N*[a] | *Correlation with Transition Success* |
|---|---|---|---|---|
| Demographic: | | | | |
| Age | 16.99 | 1.08 | 584 | -.14*** |
| Sex | .44 | .50 | 582 | -.18*** |
| White | .75 | .43 | 584 | .19*** |
| Black | .16 | .37 | 584 | -.16*** |
| Hispanic | .06 | .23 | 584 | -.14*** |
| Hearing Loss | 1.75 | .43 | 570 | .05 |
| Additional Disabilities | .28 | .45 | 583 | -.13*** |
| Mother's Hearing Status | .06 | .25 | 531 | .01 |
| Father's Hearing Status | .06 | .24 | 515 | .02 |
| Training: | | | | |
| Integration Status | .30 | .46 | 563 | .22*** |
| Communication Mode | 1.92 | .26 | 559 | -.11** |
| Mix of academic and vocational coursework | 3.73 | 1.10 | 576 | .27*** |
| Whether students had a VR counselor in high school | .69 | .46 | 580 | .01 |
| Whether students had an IWRP | .28 | .45 | 436 | .02 |
| Transition Outcome: | .64 | .48 | 584 | — |

[a]*N*s are weighted to reflect 1987 counselor survey sampling strategy.
** $p < .01$
*** $p < .001$

above, many of the demographic and training variables included in the present analysis correlated significantly with transition success. However, these correlations are difficult to interpret, since the predictor variables are themselves intercorrelated. A regression modelling approach allows us to assess the unique contributions of each of the predictors to a successful outcome.

In the current analysis, two models will be evaluated; the first will include all of the predictor variables. Based on this analysis, a simpler model will be evaluated with fewer variables.

The results of the first logistic regression analysis appear in Table 2. In this analysis, complete data were available for 299 respondents. With this large number of variables, missing information resulted in a loss of 173 individuals from the data set being analyzed. The model presented in Table 2 resulted in a Log Likelihood Chi-Square of 92.36 points (with 13 df), indicating a model with a high degree of statistical significance. When the model was used to predict transition success for the youth in the sample and the predictions compared to the observed outcomes, 72% of the students in the sample were correctly classified. Of the errors in classification, a far greater percentage occurs among unsuccessful students, that is, the model overestimated the likelihood of success for unsuccessful students, based on their characteristics. While 88% of the successful youth were correctly classified through application of the model equation, only 42% of the unsuccessful students were correctly classified.

*Table 2. Logistic Regression Analysis, Successful Transition Model 1*

| *Variables* | *Coefficient* | *Antilog* |
|---|---|---|
| Intercept: | 2.0789 | |
| Demographic Variables: | | |
| Age | -.2521 | .7771* |
| Sex (1=Female) | -.8432 | .4303*** |
| Black (dummy variable) | -.8288 | .4366** |
| Hispanic (dummy variable) | -1.2865 | .2762* |
| Hearing Loss | .5022 | 1.6523 |
| Additional Disabilities | .3314 | 1.3929 |
| Mother's Hearing (1=deaf/hard of hearing) | -1.4398 | .2370 |
| Father's Hearing (1=deaf/hard of hearing) | 1.4162 | 4.1213 |
| School Variables: | | |
| Integrated with Hearing Students? (1=yes) | .7266 | 2.0680* |
| Communication Mode (1=sign/speech) | .1159 | 1.1229 |
| Mix of Academic and Vocational Coursework | .4718 | 1.6029*** |
| Had a VR counselor in high school | .5976 | 1.8178* |
| Had an IWRP | -.1427 | .8670 |

* $p < .05$
** $p < .01$
*** $p < .001$

Table 2 reveals that three demographic variables (age, sex, and race) exert strong and independent effects on an individual's likelihood of experiencing a successful transition. The significant bivariate correlations hold up as independent effects in the model: older students (those in high school beyond normal graduation age) are less likely than younger students to have successful transitions; females are less likely than males to

make successful transitions; blacks and Hispanics are less likely than white, non-Hispanic students to make successful transitions.

The antilogs provide indications of the magnitudes of these statistical effects. For example, the antilog for the Hispanic variable indicates that the odds of Hispanic students experiencing a successful transition were only .28 those of white, non-Hispanic students. Similarly, the odds of females making a successful transition were only .43 those of males.

Three school effects were significant in the model presented in Table 2: integration status, mix of academic and vocational coursework, and having a VR counselor. For these variables, the antilogs greater than 1 indicate the positive effects of these variables. For example, students who were integrated with hearing students in 1987 were more than twice as likely as students who were not integrated (antilog=2.0680) to experience a successful transition.

Model testing and specification of a final model. The six significant variables from Model 1 were tested without the other predictors. In this analysis further simplifications of the variables were made: given the similar effect of being black and being Hispanic, the two racial/ethnic minority groups were combined to form one "minority" category. A separate analysis was performed to determine the linearity of the effect of the mix of academic and vocational training variables. It was determined that the effect was not linear, that is, the likelihood of success did not increase at a constant rate for each point on the scale. The variable was therefore dichotomized; those students who were reported as having all or mostly academic coursework were classified as "academic" students, and those students who were reported as having all or mostly vocational coursework plus those reported as having an equal mix of academic and vocational coursework were classified as "vocational" students.

When these simplifications were made and the model retested, the effects of age and having a VR counselor were not significant. These variables were dropped and the model was tested again, including the four remaining dichotomous predictors: sex (1=female), race/ethnic (1=minority), coursework (1=academic), and integration status (1=integrated). This analysis resulted in a model with four highly significant predictors. Tests for interactions among all the predictors were run by including effects that were the products of all the pairs of predictors. None was significant. Therefore, the four-variable model, presented in Table 3, was determined to be the best fitting model with the current data.

Since fewer variables were included in Model 2, there were fewer cases deleted due to missing information. The Model 2 analysis was based on 395 cases with complete data on all dependent and independent variables. The model Log Likelihood Chi-square equalled 91.83, with 4 df, which was highly significant. In the classification analysis, application of the model to the sample respondents yielded successful predictions of transition success for 71% of the sample (a figure differing by only one percentage point from the classification analysis presented above for Model 1). Again, the model overestimated the likelihood of success for unsuccessful students: 88% of the successful students were correctly classified through application of the Model 2 equation, but only 41% of the unsuccessful students were correctly classified.

*Table 3. Logistic Regression Analysis, Successful Transition Model 2*

| *Variables* | *Coefficient* | *Antilog* |
|---|---|---|
| Intercept: | .3907 | |
| Demographic Variables: | | |
| Sex (1=Female) | -.9700 | .3791*** |
| Race/Ethnic (1=Minority) | -.7958 | .4512*** |
| School Variables: | | |
| Integration Status (1=Integrated at Least Part Time) | 1.0160 | 2.7622*** |
| Mix of Academic and Vocational Training (1=Most or All Academic Courses) | .9293 | 2.5328*** |

*** $p < .001$

The effects of the four variables in Model 2 are very strong. Females had only 38% the likelihood of success as males; minorities had only 45% the likelihood of success as the non-minority. At the same time those students who were integrated at least part-time for academic instruction with hearing students were more than 2.7 times as likely to achieve a transition success as those who were not integrated; and those whose coursework was comprised of all or mostly academic courses were more than 2.5 times as likely to exhibit a successful transition.

Estimates of the likelihood of transition success for different subgroups. As noted above, one of the benefits of logistic regression is its ability to estimate the likelihood of success for individuals with varying characteristics. The four dichotomous predictor variables in Model 2 yield 16 subgroups (e.g., white females who receive instruction with hearing students and whose coursework is vocationally oriented). Table 4 presents the predicted transition success probabilities for each of these subgroups.

The variation in predicted success rates is striking. White males who were integrated with hearing students and who received a majority of their instruction in academic courses had a very high likelihood of experiencing a successful transition—over 90%. At the other extreme, minority females who were not integrated and who received at least half of their instruction in vocational courses had a very low probability of success—20%. The coefficients obtained in the logistic regression and the estimated probabilities for population subgroups derived from those coefficients revealed that sex exerted a stronger negative effect than race on transition success. As noted earlier, the model that was tested did not consider outcomes such as "homemaker" in its definition. While no measure of which respondents were full-time homemakers at the time of the study was available, respondents were asked to report what they anticipated they would be doing in the fall following the data collection. One of the response options for this question was,"I plan to stay home caring for my family." This option was selected by 1%

*Table 4. Estimated Probability of a Successful Transition from High School for Different Demographic Groups in Different Educational Settings.*

| | White, Males | Minority, Males | White, Females | Minority, Females |
|---|---|---|---|---|
| Not Integrated Vocational Student | 60 | 40 | 36 | 20 |
| Not Integrated Academic Student | 79 | 63 | 59 | 39 |
| Integrated Vocational Student | 80 | 65 | 61 | 41 |
| Integrated Academic Student | 91 | 82 | 80 | 64 |

of the white males in the study, 3% of the minority males, 10% of the white females, and 14% of the minority females. Thus, plans for homemaking were more prevalent among the groups determined by the model to be less successful. It is not clear whether the respondents who expected to be home caring for a family were those who would have otherwise obtained jobs or attended postsecondary educational programs, or whether their stated plans were a result of their failure to obtain a job or an acceptance to a postsecondary program.

## Discussion

While it is not surprising that white males mainstreamed with hearing students and taking primarily academic courses demonstrated the highest rates of transition success, it is remarkable to observe the extent of the impact on transition of being minority, female, and in an educational program that involves little academic work and no integration with hearing students. While such effects were anticipated in the published analysis of the base year data, the importance of the current study is that it confirms the predictions made at the time by providing longitudinal evidence. It is clear that certain subgroups of the deaf student population experience far less successful transitions than do other subgroups.

Some comments are necessary regarding two aspects of the current findings: 1) the significant effects of academic integration with hearing students and enrollment in predominantly academic coursework on transition success; and 2) the failure of variables associated with vocational rehabilitation (i.e, having a VR counselor and having a formal IWRP) to achieve statistical significance in the final model.

Although academic integration and enrollment in predominantly academic coursework were described as training variables, it should be noted that no measure of IQ

or academic ability was included in the analysis to control for differences in academic abilities when assessing the impact of these different program and curricular placements. Clearly, by age 16 (the age of the youngest students included in the current study in the first year of data collection), considerable sorting of students by academic ability has occurred, and we would expect students of high ability to be placed in integrated settings and to be receiving a preponderance of academic (as opposed to vocational) coursework to a greater degree than students of low ability. Thus, these program variables in the current study may be viewed as surrogates for measures of academic skill. If such a view is taken, then transition success can be viewed as an outcome that is predictable solely on the basis of student characteristics (ability, sex, and race); schooling has little impact.

But is such a view really warranted by the current data? As noted earlier, the report of the base year data documented an array of educational experiences for which significant differences were noted among population subgroups. It is clear that, by high school, students are already on pathways that will lead either to success or failure in their transitional years. The complex interplay of demographic factors and schooling experiences are not well understood, but we do know that differences in services and in curricula are evident for different demographic subgroups, and predictions made that are based on these differences are borne out in longitudinal assessments such as the current study.

The failure of variables associated with vocational rehabilitation to significantly predict transition success, given other variables in the model, should be interpreted very carefully. The variable "having a VR counselor" does not adequately describe the range of services that may or may not be provided to students. A comparison of the most successful subgroup (white males, integrated-academic) and the least successful subgroup (minority females, nonintegrated-vocational) reveals that, in high school, a similar percentage of each group (60% of the most successful group and 68% of the least successful group) were reported as having a VR counselor assigned. Yet additional questions attempting to describe the array of services provided by VR reveals differences between these two groups and the actual services provided. While 30% of the most successful group reported receiving money for school as a VR service, only 11% of the least successful group reported financial assistance as a service they received from VR. Alternatively, 19% of the least successful group reported receiving direct job training from VR, compared to only 4% of the most successful group.

VR services are differentiated, based on the characteristics of the individual. Again, those who are perceived to be of high academic ability are more likely to receive financial assistance, and those who are perceived to be of low academic ability are provided more job training opportunities. Unfortunately, those in the lower groups, are less likely to realize successful transitions.

### *References*

Allen, T., Rawlings, B., & Schildroth, A. (1989). *Deaf students and the school-to-work transition*. Baltimore, MD: Paul Brookes Publishing Co.

Gallaudet University, in Washington, DC, is the world's only liberal arts university for deaf students. In addition to offering on-campus educational programs from the preschool to doctoral level, Gallaudet is an internationally recognized center for research, program development, and consultation related to deafness and hearing loss. Gallaudet University is an equal opportunity employer/educational institution and does not discriminate on the basis of race, color, sex, national origin, religion, age, hearing status, disability, covered veteran status, marital status, personal appearance, sexual orientation, family responsibilities, matriculation, political affiliation, source of income, place of business or residence, pregnancy, childbirth, or any other unlawful basis.